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FINAL REPORT FEED MATERIALS PRODUCTION CENTER COMMUNITY MEETING OF JANUARY 31, 1989 - (CONTAINS HANDOUTS AND AGENDA AS WELL)

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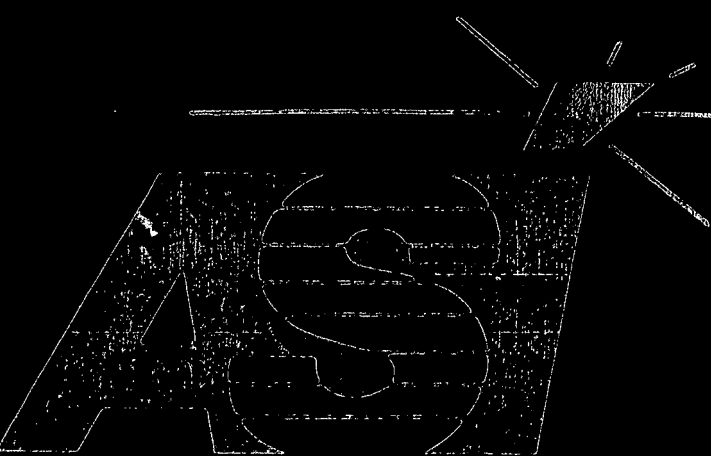
TRANSCRIPT



FINAL REPORT

FEED MATERIALS PRODUCTION CENTER

COMMUNITY MEETING

OF

JANUARY 31, 1989

Submitted to:

U.S. Department of Energy
Feed Materials Production Center
Fernald, Ohio

Submitted by:

Advanced Sciences, Inc.
10845 Hamilton-Cleves Hwy.
Ross, Ohio 45061

Data Submitted:

July 20, 1989

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The U. S. Department of Energy (DOE) held a community meeting to discuss preliminary results of the Remedial Investigation at the Feed Materials Production Center (FMPC) in Fernald, Ohio, on January 31, 1989. The meeting, held in the Ross Middle School in Ross, Ohio, drew about 250 people and lasted from 7 p.m. until about 10 p.m. Those present represented the U.S. Department of Energy; Westinghouse Materials Company of Ohio (WMCO); the U.S. Environmental Protection Agency (U.S. EPA); and the Ohio EPA; as well as Advanced Sciences, Inc. (ASI), DOE's RI/FS contractor; and International Technologies, an RI/FS subcontractor.

The public was notified of the meeting through a direct-mail letter from DOE, through posters placed at public places in the vicinity of the plant, and through news stories and advertisements in local newspapers.

The meeting was organized in two parts. During the first part, DOE and its contractors introduced the meeting and provided background on the Remedial Investigation and Feasibility Study (RI/FS), and the U. S. Environmental Protection Agency (U.S. EPA) and the Ohio Environmental Protection Agency (Ohio EPA) described their roles in the RI/FS process. During the second part of the meeting, the meeting broke into small group sessions focused on the following topics: ground water issues; surface water issues; air issues; soil issues; and FMPC environmental improvements.

Members of the public were invited to attend any or all of these sessions to ask questions directly of the technical people who are involved in the RI/FS and other studies in progress at the FMPC. The sessions were facilitated and recorded to ensure that the public had access to the information they needed and that there would be a group record of the proceedings.

The small group sessions provided a useful forum for one-to-one information exchanges between DOE and the public. Those attending submitted numerous written comments and questions, as well. This format identified topics of interest that can be discussed in future fact sheets, focused community meetings, exhibits, reading room materials, and other informational materials and activities. Press coverage was less than positive, focusing on policy decisions about topics that could have been covered in this meeting. Initial verbal and written responses for meeting attendees were, for the most part, positive.

COMMUNITY MEETING SUMMARY

FEED MATERIALS PRODUCTION CENTER
Fernald, Ohio

January 31, 1989

BACKGROUND

The U. S. Department of Energy (DOE) held a community meeting to discuss preliminary results of the Remedial Investigation at the Feed Materials Production Center (FMPC) in Fernald, Ohio, on January 31, 1989. The meeting, held in the Ross Middle School in Ross, Ohio, drew about 250 people and lasted from 7 p.m. until about 10 p.m.

The following representatives of entities performing or monitoring this environmental investigation participated in this meeting:

U.S. Department of Energy

James A. Reafsnyder, Site Manager
Larry Sparks, DOE/ORO
Mary Stone, RI/FS Project Manager

Westinghouse Materials Company of Ohio

Lou Bogar
Dave Brettschneider
Dennis Carr
Sally Clement
Bob Conner
Gerry Gels
Bob Kispert
Andrew Macaulay
Paul Mohr
Bryan Speicher
Tom Walsh

U.S. Environmental Protection Agency

Catherine McCord, Remedial Project Manager
Anne Rowen, Community Relations

Advanced Sciences, Inc.

Dick Wilde
Rich Clark
Bob Lenyk

IT Corporation

John Fraizer
Bob Galbraith
Gary Gaillot
Joe Yeasted

Ohio Environmental Protection Agency

Graham Mitchell
Rich Bendula
Mike Starkey

The public was notified of the meeting through a direct-mail letter from DOE, through posters placed at public places in the vicinity of the plant, and through news stories and advertisements in local newspapers. Attachment A includes samples of this pre-meeting publicity.

The meeting was organized into two distinct segments. During the introductory session, DOE and its contractors provided background on the Remedial Investigation and Feasibility Study (RI/FS). The U.S. Environmental Protection Agency (U.S. EPA) and the Ohio Environmental Protection Agency (Ohio EPA) also described their roles in the RI/FS process. Later, the meeting divided into small group sessions focused on the following topics: Air Issues; FMPC Environmental Improvements; Surface Water Issues; Ground Water Issues; and Soil Issues. Each session featured technical experts.

Members of the public were invited to attend any or all of these sessions to ask questions directly of technical staff involved in the RI/FS and other studies in progress at the FMPC. The sessions were facilitated and recorded to ensure that the public had access to the information and that there would be a group record of the proceedings. The facilitator in each technical session introduced the technical panelists, fielded questions, distributed and collected comment cards and evaluation forms, posted large, readable meeting notes in the callroom, and requested participants to sign up for the RI/FS mailing list (summarized in Attachment D). Each recorder summarized the salient points of each question and answer discussed, noting items requiring follow-up action.

In addition to the formal presentation and group sessions, the public was invited to view the 10x22 foot RI/FS exhibit in the auditorium. The exhibit featured a 6-1/2 minute videotape about the FMPC RI/FS, as well as individual panels describing the area's geologic history, the RI/FS process, sampling and monitoring activities, and remediation technology. Actual field sampling and monitoring equipment and a well model were also displayed.

A variety of materials were available to the public on tables in centrally located hallways. These materials included nine fact sheets (provided in Attachment B), comment cards (questions and comments are summarized in Attachment B), and meeting evaluation forms (summarized in Attachment D).

MEETING SUMMARY

Introductory Session

The introductory session of the meeting gave the public an overview of the RI/FS process and results obtained thus far, and introduced U.S. EPA and Ohio EPA representatives. Key points made by each speaker during the introductory sessions include:

Paul Mohr WMCO Manager of Communications and Public Information

Mr. Mohr explained the agenda for the evening, including the introductory session and the small group sessions that would follow. He said that regular updates on the RI/FS would continue to be published, and that the next community meeting would be held in April 1989.

James A. Reafsnyder DOE Site Manager of the Feed Materials Production Center

Mr. Reafsnyder explained the Federal Facilities Compliance Agreement (FFCA) between the DOE and the U.S. EPA. Key points are:

- The Remedial Investigation (RI) and Feasibility Study (FS) will lead to the type of cleanup needed at the FMPC.
  - The RI identifies what hazardous materials are present in the environment.
  - The FS examines options for cleanup with EPA approval.
- An important part of the RI/FS is public interaction activities, such as fact sheets and public meetings.
- After the RI/FS has been completed, the next step is remediation, or cleanup.
- The DOE oversees the RI/FS and recommends cleanup actions that might need to be taken.
- The U.S. EPA approves plans and cleanup actions.

Mr. Reafsnyder showed a diagram of RI/FS organizational responsibility.

Catherine McCord U.S. EPA Remedial Project Manager

Ms. McCord explained that Superfund, the Comprehensive Environmental Reclamation and Compensation Liability Act (CERCLA), and the Superfund Amendments and Reauthorization Act (SARA) refer to the same set of activities: to study, under the supervision of U.S. EPA, radioactive and other hazardous substances in the environment; and to implement remedial action(s) to mitigate concerns identified in the study.

She noted that according to the FMPC Community Relations Plan, DOE has committed to holding three public meetings a year to inform interested parties of progress and plans at the site (The Community Relations Plan, as part of the entire RI/FS Work Plan, is available for public review in the FMPC reading rooms at the FMPC and at the Lane Public Library.) According to the CRP, DOE has committed to publish four RI/FS related fact sheets each year. Ms. McCord encouraged members of the public to voice any concerns they may have about the RI/FS. Enforcibility language was added to the Federal Facilities Compliance Agreement in July of 1988 to clarify that citizens can sue the Department of Energy. She also introduced Ann Rowen, U.S. EPA's Community Relations Coordinator for this project.

Graham Mitchell Supervisor with Southwest Ohio EPA

Mr. Mitchell informed the group that the Ohio EPA, in cooperation with the U.S. EPA, is currently overseeing the FMPC RI/FS. He introduced Mike Starkey and Rich Bendula of his staff. He encouraged people to ask questions and make comments about the work at the site.

Dick Wilde ASI Project Director

Mr. Wilde gave a 20-minute slide presentation on the work being conducted at the FMPC during the RI/FS. His main points were:

- The RI/FS is performed in accordance with a U.S. EPA-approved work plan.
- The work plan is based on prior studies of the site and on a knowledge of past site operations.
- Key activities that have taken place include:
  - Thus far, 111 of 128 monitoring wells have been installed. Three rounds of ground water sampling have been completed.
  - Data have confirmed a plume with elevated uranium in ground water to the south of the FMPC.
  - Data indicate elevated uranium concentrations of soil beneath the Waste Pit area on the site.
  - Soil data indicate some cleanup will be required in the Production/Waste Pit area and near the Sanitary Sewerage Treatment Facility.
  - Soil data obtained off site indicate that no remedial action is needed.
  - Results to date of plant and animal analyses show no significant amounts of contamination present.
- A detailed investigation of the Production Area is scheduled to start this spring.
- Future meetings of this type will be held to discuss new data from ongoing studies.
- This type of meeting was held so that the public could meet face-to-face with the scientists and engineers who are doing the work.

Working Sessions

The working session summaries are based on group notes that were taken by the recorder in each session. This section summarizes the information exchanges that occurred between the technical staff and area residents. The technical panelists identified RI activities, such as sampling locations, on large maps and other drawings derived from the RI studies. A more complete presentation is included as Attachment C.

AIR ISSUES

The session on Air Issues was staffed by Gerry Gels, health physicist; Bryan Speicher, engineer; and Tom Walsh, professional meteorologist. In a short presentation about procedures and results of the air monitoring program, the main points discussed were the distance of the air-monitoring stations from the FMPC boundary, the possible distance that uranium particulates could travel in air, and ongoing measurements that are taken determine public exposure levels.

In addition to the questions and answers that followed this presentation (summarized below), some participants commented that they didn't feel they could trust information from DOE and its contractors.

Questions about hazardous materials that may be in the air. Participants asked what types of air pollution can leave the plant, whether gases are escaping from the silos or pits, whether uranium discharged into the air had been carried to populated areas, and what the findings have shown in the direction of the prevailing winds to the north-northeast. Residents also asked about a high uranium reading at the Elda School air monitoring station.

The technical staff responded that uranium particulates have left the plant in the past. Uranium is heavy and cannot travel very far before it falls to the ground. Thus, most of the uranium that escaped from the stacks is still in the plant area. Concentrations to the north-northeast are slightly above natural background in the area nearest the plant. The high reading reported at the Elda School air monitoring station was noticed first at the on-site air monitoring stations and then at Elda School when the off-site American Meteorological Society data was received.

Questions about monitoring procedures and equipment. Participants asked at what distance the air monitoring stations operate, what it means when a monitoring station has a light on, and whether the results will be released to the public.

The technical staff said that the air monitoring stations located on and off the site operate 24 hours a day and are sampled and analyzed weekly. The light in a monitoring station is a problem indicator. An annual report is available from WMCO that includes information on winds and the results of the FMPC air monitoring program.

AIR ISSUES (continued)

Questions about health effects. Participants asked if a health study has been made of people in the vicinity, what kinds of emissions can be hazardous, and what the health effects of contaminated air emissions on young people might be.

The technical staff responded that the National Centers for Disease Control in Atlanta, Georgia, handle such health studies. Hazardous emissions would include uranium and chemicals such as ammonia, hydrogen fluoride, and nitric acid (nitrous oxide). Important factors in evaluating hazards include amounts, concentrations, and locations of releases. Effects on young people will be evaluated during the risk assessment.

Questions about emergency preparedness. Participants asked about DOE's plans in the event of a general emergency, and, more specifically, about DOE's plans if the K-65 silos were damaged or destroyed in a storm, causing a release.

Technical staff said that the FMPC holds monthly meetings for emergency response personnel from fire departments, schools, the plant, and other such groups. In addition, there is a notification system through the local authorities. The material in the K-65 silos is packed so that it would not very likely be released, even if there were storm damage. WMCO is monitoring the air for the presence of radon. An independent contractor is monitoring any emissions at the silos, at the boundaries, and at off-site locations. The possibility of the silos being totally destroyed was not seen as a life-threatening situation.

FMPC ENVIRONMENTAL IMPROVEMENTS

The session on FMPC Environmental Improvements was staffed by WMCO's Bob Kispert, manager of waste remediation and environmental engineering, and Andy Macaulay, capital projects manager; and Mary Stone, DOE's RI/FS project manager. Bob Kispert discussed major environmental restoration activities at the FMPC. The presentation was followed by a question-and-answer session. The information exchanged during the session is summarized below.

Questions about the K-65 silos. Participants asked about the silos' contents, their ability to withstand natural disasters, and the success of the foam injection program.

The technical panel explained that the silos contain low-level radioactive residue materials from uranium processed out of Belgian Congo pitchblende, uranium ore concentrates. They relied on the results of structural assessments to answer the structural stability question. The exterior foam coating project that occurred in late 1987 was described as highly successful. Staff explained that the air above the stored material was withdrawn, clean air was recycled, and radon was reduced to low levels.

FMPC ENVIRONMENTAL IMPROVEMENTS (continued)

Questions about the waste pits. Participants asked about the contents of the pits and possible remediation alternatives.

The panel explained that the pits are lined to prevent leaks and that Pit 4 contains depleted uranium waste, graphite, and concrete. Future activities will be decided by the U.S. EPA after the pits are studied and alternatives identified. It is necessary to characterize the waste pits and silos through the RI/FS so eventual recommendations are based on factual data.

Questions about plant production and possible shutdown. Participants asked several questions about reasons for a potential shutdown and reasons for continued production.

The panel answered these questions by citing economics, decreased demand for the plant's product, and cheaper alternatives now available to DOE. The DOE 2010 Report was addressed. The panel stated that uranium production at the FMPC is expected to continue through 1994. Noting that the DOE 2010 Report attempts to project beyond 1994 requires the DOE to systematically plan long-range production needs and identify supply sources.

The question concerning the possibility of a replacement facility if the FMPC were to shut down has yet to be addressed by the federal government, although commercial procurement is being given strong consideration.

Questions about environmental issues. Participants asked about DOE's plans for the environmental investigation if the plant should close, about DOE's concern for the environment, about environmental monitoring at the plant, and about the need for another environmental impact statement (EIS).

The panelists were firm in DOE's commitment to continuing the environmental investigation, regardless of plant closure. They demonstrated DOE's concern for the environment by citing DOE presence in a local DOE office, a much higher level of support and funding than in the past, and the fact that the FMPC is number one on the list of sites to clean up. They reiterated DOE's accountability by citing records on drums that date back to the plant's opening 37 years ago. They also said the environmental investigation does not depend on Superfund money, that DOE funds for this project are budgeted by DOE.

Participants were advised to see the display available at the meeting for more information on monitoring. The need for an additional EIS would be determined as significant changes occur- the first EIS covered plant equipment and modernization.

Questions about materials and storage options. Participants asked about materials (such as anhydrous ammonia) stored on site, and about the time frame for repackaging and transportation of materials off the site.

FMPC ENVIRONMENTAL IMPROVEMENTS (continued)

The technical panel said the anhydrous ammonia has been removed from the site. There is a systematic program for repackaging low-level radioactive wastes and transportation to locations off the site, and that the mode-of-future transportation is yet to be determined. The local railroad will not be used if it is unsafe. The panel said thus far the issue of an available off-site repository for thorium materials has not been resolved.

Questions about public involvement. Participants asked how they could become familiar with relevant RI/FS documents, such as the Federal Facility Compliance Agreement. They also wanted to know why it takes 90 days to read RI/FS documentation.

The panelists referred the audience to the public reading rooms. They said attempts are being made to divide the RI/FS documentation into components so it will be more manageable.

Questions about EPA's role. Participants asked about EPA's role in the final cleanup at the site.

The panelists said DOE will recommend alternatives for cleanup and EPA will make the final decision. Following EPA review of DOE's recommendation, the public will be invited to review and comment on the plan. EPA will take these comments into consideration when making its final decision.

SURFACE WATER ISSUES

The session on Surface Water Issues was staffed by Sally Clement, geologist; Dave Brettschneider, project engineer; and Joe Yeasted, technical manager for the RI/FS. The information exchanged during the question-and-answer session is summarized below.

Questions about results of studies. Participants asked whether the water from the Cincinnati Bolton water plant is safe and whether any bodies of water show higher levels of uranium concentration. They also asked about background levels of uranium in surface water and fish.

The technical team responded that their studies show that the water in the Cincinnati Bolton water plant shows no elevated levels of uranium, and that the Great Miami River exhibits slightly elevated uranium levels (up to 5 micrograms per liter) only in close proximity to the main discharge point from the FMPC. Background levels in the Great Miami River, which have remained relatively consistent over the years, are about 1.2 micrograms per liter. Fish flesh from the Great Miami River has been tested for total uranium; macro-invertebrates in Paddy's Run were also tested.

Questions about health effects. Residents asked whether drinking water containing elevated levels of uranium presents risks.

SURFACE WATER ISSUES (continued)

The technical team answered that the concentration of uranium in the Great Miami River is many times below U.S. EPA's proposed standard for drinking water.

Questions about the pits and basins. Participants asked whether the oldest pits are leaking into the aquifer, whether residue was taken out of the pits, what the depths of the pits are, and how stormwater basin control is managed.

Responding to the pit questions, the panel said that Pit 3 has been covered since the 1960s, and Pits 5 and 6 are off line; rain is the only water that enters them. Pits 5 and 6 are rubber lined. The pits range up to 30 feet deep.

Regarding basin control, they explained that surface water is diverted into the storm water retention basins, where it settles for 24 hours before being discharged into the river. Capacity of the basins is 10.2 million gallons.

Questions about standards. Participants asked whether the FMPC is in compliance with National Pollution Discharge Elimination System (NPDES) standards, and how "as low as reasonably achievable" (ALARA) comes into play.

The technical team answered that the FMPC is in compliance with NPDES in some areas, but not others. ALARA refers to health and safety goals in the ongoing operation of the plant; it refers to the effort to make the plant as safe as possible, as opposed to merely meeting promulgated standards.

GROUND WATER ISSUES

The session on Ground Water Issues was staffed by Bob Galbraith, RI/FS on-site technical coordinator; Gary Gaillot, RI/FS task leader for hydrogeology and modeling; and Dennis Carr, engineer. Bob Galbraith gave a short presentation on preliminary results of the remedial investigation of ground water, which show that there are elevated levels of uranium in the ground water in a pattern that extends south of the FMPC. The presentation covered drilling and sampling programs, water-level measurements in wells, and mapping of data. The presentation was followed by a question-and-answer period. The information exchanged during the session is summarized below.

Questions about uranium. Participants asked about the types of uranium for which DOE is testing, the presence of "normal" or enriched uranium in the area, and values and locations of maximum concentrations.

The technical panel said that all types of uranium are being investigated. Background levels of total uranium in ground water in Ohio tend to be about 1 to 3 micrograms per liter. The highest concentrations in ground water found thus far have been about 15,000 micrograms per liter

SURFACE WATER ISSUES (Continued)

of total uranium. These concentrations are found about 20 feet below the ground surface inside the waste storage area. No uranium has been found above background levels in ground water east of the plant.

Questions about sampling methods, procedures, and timing. Participants asked where test wells were drilled, why the water was analyzed only for uranium, and when the studies would be completed and the reports available.

The well installation program was identified on maps, indicating that this program extends beyond plant boundaries. The water samples taken were analyzed for many substances; the panelists referred to uranium as a key indicator because it is found more often than other substances. The studies on ground water south of the plant will be completed in early 1990; the remainder of the studies will be completed in 1992. Preliminary reports will be prepared in the interim, but final reports will not be available until 1990 at the earliest.

Questions about private wells: Residents asked whether they could get their wells tested and about ways to remove the uranium from their well water.

WMCO will test private wells; residents were urged to call Renae Cook at WMCO (738-6924) to make a request. The U.S. EPA has prepared a booklet about protecting oneself from uranium in water.

SOIL ISSUES

The Soil Issues session was staffed by John Frazier, RI/FS radiological scientist; Rich Clark, RI/FS biologist; and Bob Conner, project manager. John Frazier made a brief presentation describing the goals and tasks of the soils study, which included systematic sampling of the surface soils throughout the FMPC property, the review of earlier sampling, and taking radiation measurements over 300 acres suspected of having elevated levels of uranium. Results showed that uranium was the only substance found in significant concentrations on the site and in small areas adjacent to the site.

The introduction was followed by questions and answers. The information exchanged during the session is summarized below.

Questions about uranium. Participants asked how easily uranium moves around in the environment, what normal levels in the area are, and whether plants and grasses take up uranium from the soil.

The technical staff said that uranium is 1-1/2 times as dense as lead, and it does not tend to wash away during the rain, or blow in the wind. Normal levels of uranium in Ohio range from 1.5 to 4.5 picocuries per gram. In areas where elevated levels of uranium are present in the soil,

SOIL ISSUES (continued)

roots of plants typically show elevated levels of uranium; upper parts of plants tend to have much less activity. Produce in the area shows no elevated levels of uranium when compared to Indiana produce.

Questions about test results. Participants asked whether the top two inches of soil tend to have higher concentrations of uranium, whether elevated readings were found at the Elda School, what the animal studies show, and how far from the site elevated levels extend.

The technical team said that they had expected to find higher levels of uranium in the upper two inches of soil, and this is what was found on FMPC property and on localized off-site areas adjacent to the FMPC. Studies on a cow on Knollman's farm, a deer from the area, and numerous small animals have not shown elevated levels of uranium in animal studies. The technical team found that natural background concentrations of uranium in soil were found within 1 to 1-1/2 miles from the plant.

Questions about confidence in DOE's studies. Participants raised questions about the reliability and validity of the studies being conducted and stories in the press that contradict DOE's statements.

The technical team assured participants that testing and analysis followed very strict procedures that protected against mistakes and manipulation of the results. To assure adherence to procedures, the studies are carried out under the independent oversight of U.S. EPA and Ohio EPA. Sampling results indicate that off-site areas having above-background concentrations of uranium in soil are found adjacent to the FMPC and not beyond approximately 1 to 1-1/2 miles from the center of the property.

Questions about effects of uranium exposure on humans. Participants asked about studies done on body parts of FMPC employees, about children living in the area who have become very ill, and about the possibility of residents being tested for uranium in their bodies.

The technical team said they were not aware of tests performed on FMPC employees. Although the technical team had read about the cases of two small children who became ill, they have been unable to obtain copies of the study and examine the information personally. The WMCO representative said that a whole-body scanner can be made available for use at the FMPC.

Questions about procedures. Participants asked about the gridwork used for the soil sampling, about the substances that were investigated, and about the number of locations sampled.

The technical team said that the RI/FS uses 1,000-foot intervals. Sampling grids are set 2,000 to 2,400 feet apart for the litigation study and as close as 250 feet on the property. Samples taken along the north and east plant boundaries were at 250-foot intervals. The production area was sampled at 250-foot intervals, as well. Samples were analyzed for isotopic uranium, isotopic

SOIL ISSUES (Continued)

thorium, cesium-137, ruthenium-106, strontium-90, technetium-99, neptunium-237, and isotopic plutonium. Soil sampling results were obtained for more than 600 sampling locations.

IMPACT OF THE MEETING

Along with communicating verbally with the technical specialists on hand during the individual working sessions, community members attending the January 31 Community Meeting asked questions and provided feedback about the meeting in several ways. They completed comment cards, added their names to the RI/FS mailing list, and provided written evaluations of the meeting, using simple forms provided. This feedback provides useful information about the community's information needs, their concerns, and their perceptions about the RI/FS process, including public meetings. This information can, in turn, be used as a valuable planning tool to identify topics for future meetings or written materials, such as fact sheets.

Initial written responses from meeting attendees were, for the most part, neutral to positive. Twenty-one requests for further information were received, 41 names were added to the RI/FS mailing list, and nine meeting evaluations were completed and returned. (See Attachment D.) Verbal responses were similar. However, some residents expressed dissatisfaction that the simultaneous scheduling of technical sessions and prevented them from attending all sessions.

Post-meeting publicity did not capture the essence of the information exchange that occurred. The newspaper articles questioned DOE's credibility with their content and tone, focusing instead on what was not said at the meeting. Coverage (Attachment A) in the local press concentrated on the U.S. EPA point of view. The articles also quoted a spokesperson for Fernald Residents for Environmental Safety and Health (FRESH) who criticized the meeting format. Local television coverage was minimal. Videotapes of local newscasts that featured reports about the meeting are filed in WMCO's video production department.

LESSONS LEARNED

Several lessons can be learned from this community meeting experience.

The meeting was planned and executed in a compressed schedule of less than two months. Preparation time included creation and approval of materials (audio-visuals to accompany presentations during the introductory session, RI/FS maps, fact sheets, comment cards, evaluation

LESSONS LEARNED (Continued)

forms), scheduling, facility arrangements, pre-meeting publicity, coordination of speakers, and media relations. The compressed schedule did not allow for timely, meaningful input from all entities who made presentations during the meeting. Pre-meeting publicity was targeted and adequate.

The modified availability session meeting format is new, based on the public's need for more detailed technical information. Meeting planners realize that it is impossible to meet the community's information needs in one meeting; however, the small group sessions provided a useful forum for one-to-one information exchanges between DOE and the public. This format also encouraged participants to suggest numerous topics of interest that can be discussed in fact sheets, focused community meetings, exhibits, reading room materials, and other informational materials and activities. These are summarized in Attachment D.

In response to criticism that the simultaneous scheduling of sessions prevented residents from "seeing the whole picture", future scheduling could allow for two or three "periods" so residents could attend more than one, and perhaps all, working session during any one community meeting. Also, a "wrap-up" session could provide an opportunity to summarize each individual session.

The use of facilitators and recorders for future community meetings can be more effective with more stringent staff selection and training procedures.

The Ross Middle School proved to be an excellent meeting location. The setting was neutral, thus encouraging the open technical dialogue that ensued. It was also accessible to the public. Some problems occurred with the public address system. The technical working sessions were held in classrooms. Some of the rooms were conducive to this type of meeting; a few were too small to handle the crowds (as many as 25-30 attended some sessions), there were some problems with room temperature, and available wall space was barely adequate to hold the recorders' documentation of meeting notes. The school staff was most cooperative.

ATTACHMENT A

PRE-MEETING AND POST-MEETING PUBLICITY
FOR JANUARY 31, 1989 FMPC RI/FS
COMMUNITY MEETING

PRE-MEETING PUBLICITY
FOR JANUARY 31, 1989 FMPC RI/FS
COMMUNITY MEETING

Pre-meeting publicity consisted of a one-page "Dear Neighbor" letter dated January 19, 1989. Approximately 2,000 were distributed to persons on the mailing list. In addition, 8-1/2x11 inch flyers were distributed in local stores and schools. The same text was used for advertisements in local newspapers. Both are provided in Attachment A. The Community Meeting program is also included in Attachment A.

Department of Energy
Oak Ridge Operations
P. O. Box E
Oak Ridge, Tennessee 37831

January 19, 1989

Dear Neighbor:

As you are probably aware, the U. S. Department of Energy is conducting an environmental study at the Feed Materials Production Center which will ultimately result in a decision by the U. S. Environmental Protection Agency regarding what must be done to resolve environmental problems that have developed at the FMPC since it opened more than 35 years ago.

Called the Remedial Investigation/Feasibility Study (RI/FS), this investigation will determine the extent of any environmental problems and develop alternatives for addressing these issues. Once the alternatives are identified, the U.S. EPA will consult with the Ohio EPA and others before issuing a decision on what remediation actions are required.

Sharing information with members of the public is vitally important, both as we proceed with the RI/FS effort and move toward final resolution of the environmental problems we identify. One of the most effective ways to share that information is through public meetings.

The first of these meetings will be held Tuesday, January 31, at 7 p.m. at Ross Middle School located just north of Ross. (In the event of a snow emergency, the meeting will be rescheduled on Tuesday, February 7.) We encourage you to attend the meeting, ask questions, and offer your comments on how the RI/FS effort is progressing.

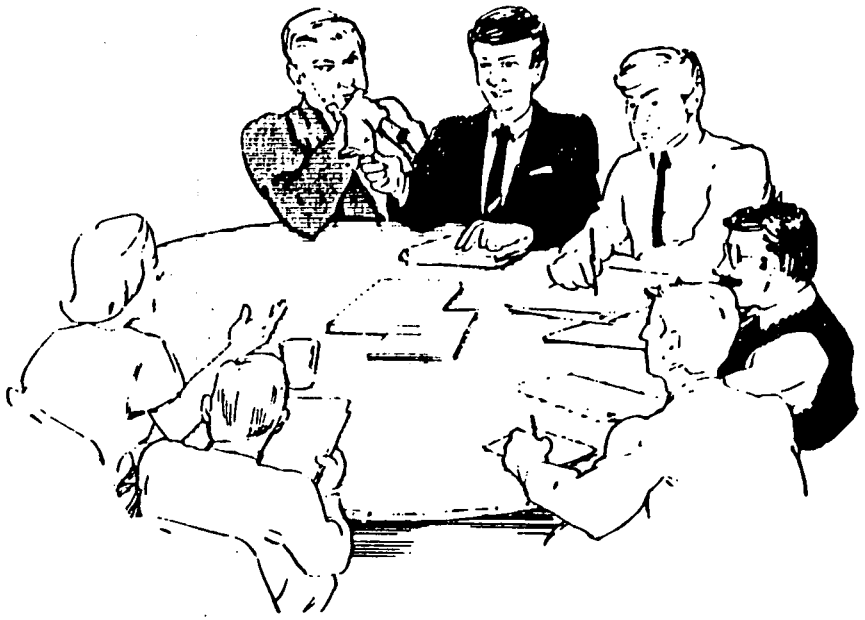
The meeting will include brief comments from the DOE and its contractors, then will break into small groups focusing on the specific elements of the RI/FS, including surface soils and biology, ground water contamination, regulatory processes, the RI/FS process, and FMPC environmental restoration activities. Scientists and engineers from Advanced Sciences, Inc., the contractor doing the environmental investigation, will be available to answer questions and explain the methods being used to gather the necessary environmental data. Representatives from U.S. EPA and Ohio EPA will participate in the evening's agenda. While we expect the sessions to last about an hour to an hour and a half, our people will remain available until everyone's questions have been answered and their comments received and noted.

Your understanding of and participation in the RI/FS process is important. We look forward to meeting you January 31.

Sincerely,

Raymond J. Hansen
Deputy Site Manager

COMMUNITY MEETING



Feed Materials Production Center

1961

AGENDA

7:00 p.m. Introduction and Welcome

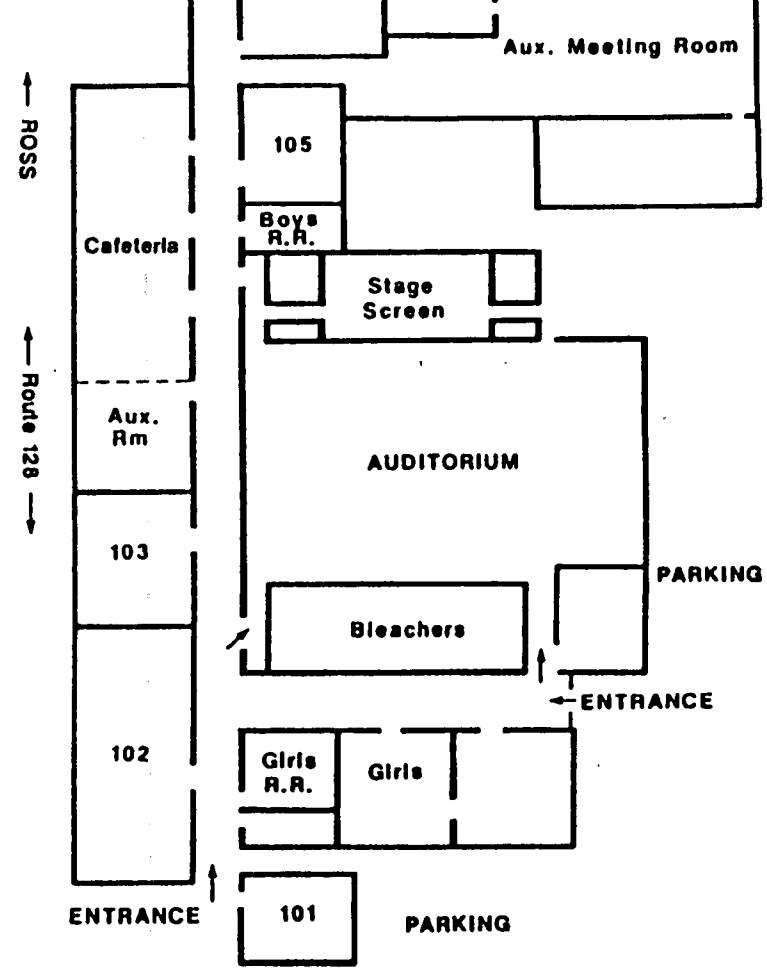
DOE Background

USEPA Role
OEPA Role

RI/FS Process, Results and Overview

8:00 p.m. Small Group Meetings

- Air Issues
  Room 101
- FMPC Environmental Improvements
  Room 102
- Surface Water Issues
  Room 103
- Ground Water Issues
  Room 105
- Soil Issues
  Auxiliary Room
- RI/FS Videotape and Exhibit
  Auditorium



ROOM ISSUES

101 Air Issues
102 FMPC Environmental Improvements
103 Surface Water Issues
105 Ground Water Issues
Aux. Room Soil Issues

RI/FS Video and Exhibit are located in the Auditorium

POST-MEETING PUBLICITY FOR JANUARY 31, 1989 FMPC RI/FS COMMUNITY MEETING

After the meeting, several newspaper articles and a few local newscasts reported on the January 31 Community Meeting. Copies of the newspaper articles are attached.

Videotapes of local newscasts that featured reports about the meeting are maintained by WMCO's video production department. This file is based on their routine monitoring of local newscasts for stories about the FMPC. In addition, WMCO filmed the Introductory Session and several crowd scenes during the January 31 Community Meeting.

DOE officials wouldn't discuss genetic damage

BY M.A.J. McKENNA
The Cincinnati Enquirer

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The work was done by three Miami University professors under a confidential contract with Westinghouse Materials Co., operators of the Fernald plant.

Catherine McCord, Fernald project manager for the EPA, said Thursday that she asked DOE twice to put the research results on the meeting's agenda — *the second time, in a formal* letter.

Despite those requests, the professors' findings of genetic abnormalities in toads were not discussed. Residents did hear anoth-

(Continued on page C-4, FERNALD)

Cleanup checklist

BY M.A.J. McKENNA
The Cincinnati Enquirer

Representatives of governors from nine weapons-plant states, including Ohio, this week agreed on several priorities for their states to pursue with the federal Department of Energy or directly to President Bush:

■ DOE must reach a final estimate of funds required for cleanup. At Fernald, the estimate varies from $1 billion to $5 billion.

■ DOE must agree to increase cleanup appropriations, which for 1990 equal less than 10% of the total necessary.

■ DOE and the administration must design a comprehensive cleanup program and schedule it against funding commitments for future years.

THE CINCINNATI ENQUIRER

FRIDAY, FEBRUARY 3, 1989 SECTION C

Fernald

CONTINUED FROM PAGE C-1

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James Reafsnyder, DOE site manager at Fernald, said the report wasn't kept from the public. It isn't ready to release, he said; DOE has sent the research out to be reviewed.

"I have an obligation to the public to make sure good, technically defensible data has been presented," Reafsnyder said.

Pete Kelley, Westinghouse spokesman, said the research was still preliminary and wasn't really aimed at genetic damage.

"(The researchers) were asked to look at kinds of wildlife on-site and whether they were stressed. They were not asked to determine what caused the stress," he said.

The final report is to be issued in March.

"We're very disappointed that DOE did not make available to the public all the available data, whether it agreed with the findings or not," said Louise Roselle, an attorney representing residents in a class-action suit against the plant. "Basically, we heard nothing new Tuesday."

Reafsnyder said DOE received EPA's letter after the agenda for the meeting had already been publicized. The meeting, the first of three that DOE is required to hold each year as part of the process of studying pollution and cleanup at the plant, was held so the agency could pass findings on pollution on to citizens.

"We presented a great deal of information to the public," he said. "DOE is fully committed to cleaning up the plant."

David Osborne, one of the three authors of the study, said they have been told by Westinghouse and Miami University lawyers not to discuss their research until the report is released.

But some data on genetic analysis of fish and mayflies from Paddy's Run near the plant was used in a paper that the three presented at the annual meeting of the Ohio Academy of Science in April 1988.

That paper, which is only available from the authors, evaluated whether comparative indexes or studying the genetic material from tissue samples was more useful for discovering whether plants animals had been harmed by pollutants.

The EPA learned about the research after hearing news of the academy paper, McCord said: "We still have not seen the written report."

Based on their fragmentary information, EPA has asked DOE to ensure that additional tissue tests from the animals are done. "There is no causal relationship yet," McCord said.

DOE asks to put off cleanup

EPA talks tradeoff at Fernald meeting

BY M.A.J. McKENNA
The Cincinnati Enquirer

The U.S. Department of Energy has proposed lengthening its study of the Fernald uranium plant by 16 months, postponing decisions on cleanup to 1992 at the earliest and pitting DOE against the U.S. Environmental Protection Agency.

"The only way we will agree to any kind of slippage is that we get the things that are most important addressed quickly," said Catherine McCord, Fernald project manager for the EPA.

"The tradeoff is that things we feel are most threatening to the public health and the environment will be fixed at a faster pace."

McCord commented on the proposed postponement during a break in a DOE public meeting on Fernald, held Tuesday night at the Ross Middle School.

The postponement was not discussed during the meeting, which was attended by about 150 Fernald-area residents and attorneys representing them in a class-action suit against the plant. But the agencies' disagreement echoed citizen criticisms voiced during the meeting.

James Reaisnyder, DOE's Fernald site manager, said after the meeting that the agency asked for the extension to ensure that the "technical scope and type of cleanup required" are given enough examination time.

"It's a big task," he said. "There's a lot of areas to address."

(Please see FERNALD, back page, this section)

Fernald

CONTINUED FROM PAGE A-1

DOE's proposal asks that the remedial investigation/feasibility study, the federally-mandated study cataloguing environmental problems at the troubled, polluted plant, be split into seven sections that would each be examined separately, McCord said.

The extension to deal with those sections would push the study's completion from September, 1990, to January, 1992.

EPA plan differs

The EPA has counterproposed breaking the plant into four sections, depending on environmental difficulty — but it will only agree to that, McCord said, if DOE agrees to act immediately to clean up three areas:

- The plume of groundwater contamination flowing south from the plant that has contaminated three private wells.
- Pools of water that may be collecting under plant buildings, with levels of contamination higher than any recorded at the plant so far. The discovery of a contaminated pool under Fernald's Plant 6, now estimated to be 25,000 gallons, was reported by *The Enquirer* last week.
- The K-65 silos, which hold a combination of highly radioactive wastes.

On the first two points, the EPA will settle for interim measures until research on the problems is concluded, McCord said.

"For the K-65 silos, we want a final remedy," she said.

DOE's comments on EPA's counter-proposal are due by Friday, she said.

"Until they're willing to give on those items, the original schedule sticks."

Meeting broken up

Citizens attending the meeting criticized DOE for breaking up the meeting into several seminars. The meeting, the first of three DOE is required to hold each year as part of the federal study process, gave residents the most recent results of pollution investigations at the plant. The next meeting is tentatively planned for April.

Because the meeting was broken into a seminars addressing groundwater and surface pollution and radioactive emissions to the air, residents said they weren't able to get the whole story.

"I think it's a divide and conquer strategy," said Lisa Crawford, founder of the group Fernald Residents for Environmental Safety and Health, which has been highly critical of the plant. "They aren't being very specific."

JOURNAL NEWS
24 Pages
Hamilton/Fairfield/Butler County, Ohio
February 3, 1989

DOE withheld Fernald study from meeting

Associated Press

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Pete Kelley, Westinghouse spokesman, said the research was still preliminary and wasn't really aimed at genetic damage.

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He said the final report will be issued in March.

"We're very disappointed that DOE did not make available to the public all the available data, whether it agreed with the findings or not," said Louise Roselle, an attorney representing residents in a $300 million class-action suit against the plant.

Reafsnyder said DOE received the EPA's letter after the agenda for the meeting had already been publicized. The meeting, the first of three that DOE is required to hold each year as part of the process of studying pollution and cleanup at the plant, was held so the agency could pass preliminary findings on pollution to citizens.

David Osborne, one of the authors of the study, said they have been told by Westinghouse and Miami University lawyers not to discuss their research until the report is released.

Action may be delayed until 1992

Associated Press

FERNALD — Decisions on the cleanup of the Fernald plant could be delayed until 1992 if the U.S. Department of Energy is given an additional 16 months to study the plant.

Neighbors of the plant, who have a filed a $300 million lawsuit alleging that the plant contaminated their environment with radiation, are angered by the proposed delay.

An official of the U.S. Environmental Protection Agency, which is overseeing the department's proposed cleanup, said the EPA will not permit the delay unless the department agrees to immediately resolve problems that are threatening the plant's environment and the public's health.

"The only way we will agree to any kind of slippage is that we get the things that are most important addressed quickly," said Catherine McCord, Fernald project manager for the EPA. "The tradeoff is that things we feel are most threatening to the

(Please see DELAY, Page B-

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The EPA learned about research after hearing news the academy paper.

The EPA says it wants m biological and water tests c ducted at the plant's 1,050-a site.

EPA officials say the tests needed to determine whether taminated water or soil migh causing the mutations creating a potential health for plant neighbors employees.

Delay

(Continued from Page B1)

public health and the environment will be fixed at a faster pace."

She said the Energy Department has proposed lengthening its study of the plant by 16 months.

Spokeswoman Lisa Crawford of the citizens group FRESH (Fernald Residents for Environmental Safety and Health), said Wednesday she is angry that Energy Department officials did not mention the delay proposal at a public meeting they convened Tuesday night to discuss the cleanup study.

THE CINCINNATI ENQUIRER

FRIDAY, FEBRUARY 3, 1989

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(Please see FERNALD, Page C-2)

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ATTACHMENT B

FACT SHEETS PROVIDED AT THE JANUARY 31, 1989 FMPC RI/FS COMMUNITY MEETING

A total of nine fact sheets dealing with a variety of topics that relate to the Remedial Investigation and Feasibility Study were distributed during the January 31 Community Meeting. They were displayed in high-traffic areas during the meeting held in Ross Middle School. These fact sheets, which are provided in this attachment, include:

What Is the RI/FS?

K-65 Silos

Radon

Radiation

Monitoring

Thorium

Waste Management Vocabulary

Uranium

Waste Pits.

"What Is the RI/FS?" and "Waste Management Vocabulary" fact sheets were developed specifically for this meeting. The "What Is the RI/FS?" fact sheet is the first of a series of fact sheets designed to communicate results of and issues relating to the RI and FS.

Feed Materials Production Center
Fernald, Ohio

Remedial Investigation Feasibility Study

WHAT IS THE RI / FS ?

comprehensive environmental study entitled the edial Investigation and Feasibility Study (RI/FS) is rway at the Feed Materials Production Center C) in Fernald, Ohio. The study is being com- d for the U. S. Department of Energy (DOE) in erative agreement with the U.S. Environmental ction Agency (U.S. EPA) and Ohio Environmental ction Agency.

e RI/FS is investigating the nature and extent of ntial environmental impacts from past and current ations at the FMPC. Based upon the results of nvestigation, the RI/FS will then develop and ate engineering alternatives to mitigate the iden- environmental concerns.

THE FMPC RI/FS PROCESS: IDENTIFYING PROBLEMS AND DEVELOPING SOLUTIONS

/FS: A Brief Definition

RI/FS is a comprehensive environmental inves- on conducted in a systematic fashion in accor- e with strict federal regulations and guidance. RI/FS is broken into two distinct, yet inseparable es: the Remedial Investigation (RI) and the bility Study (FS). During the remedial investiga- hase, a broad-based study is completed to ate existing environmental and public health risks ciated with past or existing facility operations. e risks are then compared against existing atory standards and guidance to identify potential onmental problems and concerns that must be idered for corrective actions.

e Feasibility Study phase of the RI/FS process ops and evaluates corrective action alternatives tigate identified environmental concerns. The bility Study recommends one or more final dial action alternatives for consideration by the EPA in its final selection process. Following selec- f the aternatives, a Record of Decision will be is- by the U.S. EPA formally documenting the ion process.

The RI: Identifying Problems

DOE has contracted with an independent environmental firm, Advanced Sciences Inc. (ASI), to perform the RI/FS. To accomplish Remedial Investigation objectives, the ASI project team is undertaking these activities:

- Ground Water Monitoring
- Surface Water Monitoring
- Sediment Sampling
- Soils Analysis
- Biological Analysis
- Radiological Surveys

These activities are described in detail in the FMPC RI/FS Work Plan, approved by both the U.S. EPA and DOE. The Work Plan is available for public review in local reading rooms at the FMPC Administration Building and the Lane Public Library in Hamilton.

The FS: Developing Solutions

The FMPC Feasibility Study is also underway. The Feasibility Study will develop, screen, and provide preliminary analyses of available remediation alternatives. These results will support the in-depth evaluation of alternatives and selection of a proposed plan for remediation.

The final Feasibility Study report will evaluate a number of remedial action alternatives and recommend a preferred alternative based upon the defined criteria. The U.S. EPA will propose preferred alternatives and invite public comment on the Feasibility Study reports and on the recommended alternative. After state and community comments are received and studied, the U.S. EPA will select the remediation activities for the FMPC and a Record of Decision will be writ ten for each operable unit.

The U.S. EPA Role

The U.S. EPA plays a key role in the Fernald RI/FS process, as defined in the cooperative agreement and in federal laws and regulations which share concern for public health, welfare, and the environment -- both on and off the FMPC site. The U.S. EPA provides review and concurrence on all RI/FS activities.

FEED MATERIALS PRODUCTION CENTER

FACTSHEET

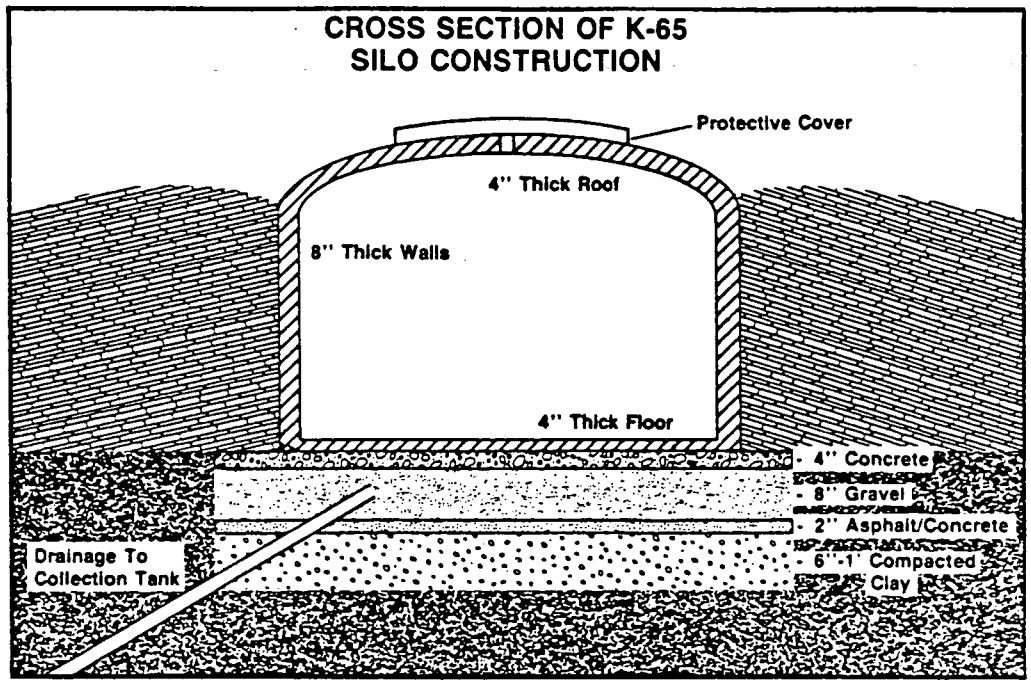
K-65 Silos

MPC WASTE STORAGE SILOS

s part of an ongoing environmental protection program, the Feed Materials Production Center (FMPC) is novating its waste storage facilities. Improving the management of wastes in two concrete silos, the K-65 os, is a part of this renovation. The K-65 silos contain radioactive wastes that would present a radiation azard if not properly contained. The facility contractor, Westinghouse Materials Company of Ohio VMCO), has taken steps to ensure that the silos are structurally sound and that the waste is isolated from e environment.

onstruction Details

he K-65 silos are 36 feet tall nd 80 feet in diameter. Their alls are 8 inches thick and ade of steel-reinforced oncrete. The domed roofs e also made of reinforced oncrete. The silos were onstructed with floors of 4- ch-thick concrete bases, hich were placed on an 8- ch layer of gravel ontaining a drainage system at leads to a collection tank. eneath the layer of gravel e layers of asphalt and clay.



Radioactive waste is stored at FMPC in steel-reinforced concrete silos.

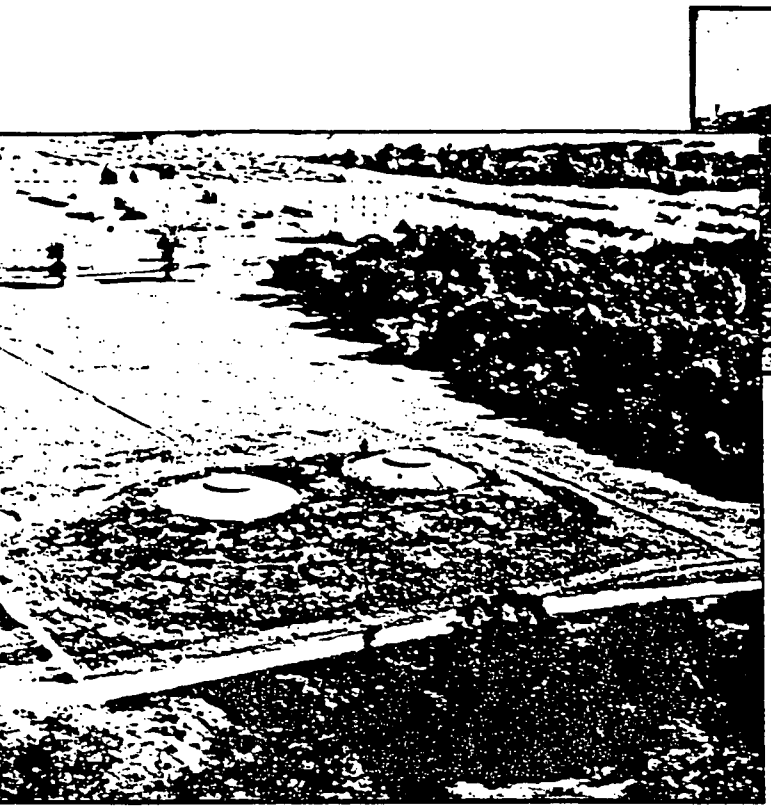
ontents of the Silos

he K-65 silos contain waste from the Manhattan Project, the World War II program that produced the first omic bombs. For this work, a uranium-rich ore called pitchblende was imported from the Belgian Congo. itchblende was treated with nitric acid to dissolve the uranium away from the ore. The remaining residues ere mixed with water and pumped into the silos, where the solids settled. The liquids at the surface were umped back out of the silos into a treatment facility. What remains in the silos now is about 9,700 tons f residual solids.

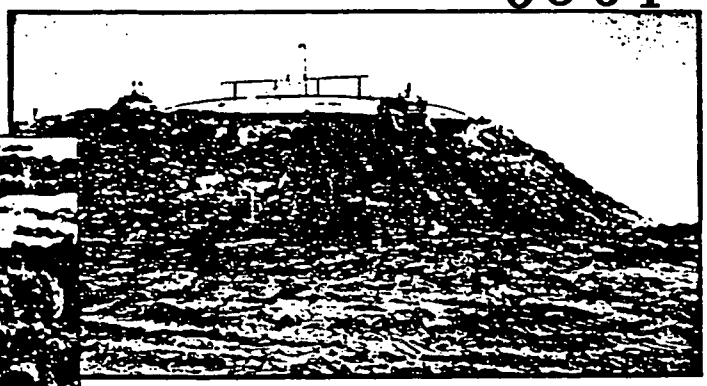
he residues in the silos emit radiation. The radioactivity levels of the residues are higher than ordinary ilings from uranium mining and milling. Like other uranium ore tailings, these residues produce radon gas, though in considerably larger quantities. FMPC has taken major steps to control radon emission from the -65 silos.

he stored residues present a potential hazard and require careful storage techniques to ensure safety and olation from the environment.

Operated for U.S. DOE by Westinghouse Materials Company of Ohio
Fernald, Ohio



stallation of protective membranes over the domes of the silos began in April 1986.



An embankment was built around the silos in 1964 to help protect them from the weather and provide structural support.

Past Improvements

In 1964, 12 years after the silos were constructed, internal corrosion and natural deterioration made repairs to the walls necessary. At that time, the walls of the silos were covered with asphalt, and an earthen embankment was placed around the silos to protect them from additional weathering. Vents in the silos were sealed in 1979, and the embankment was enlarged in 1983 to reduce erosion.

Recent Improvements

A major testing program and structural analysis of the K-65 silos took place in the summer and fall of 1985. The investigation included a reassessment of the original silo design, computer analysis of the containment structure, and field work that tested the soil under and around the silos. The resulting data was computer analyzed and then interpreted by a team of experts. Their findings concluded that, although the silos showed evidence of cracks, the walls and base concrete slabs were stable and would remain so for the next 5 to 10 years.

The tops of the silos were determined to need remedial actions. In January 1986, self-supporting, protective covers for the domes of the silos were constructed and put in the place. The installation of waterproof protective membranes over the tops of the silos began in April 1986. In late 1987, a foam coating was applied to the domes to further reduce weathering, temperature changes inside, and radon gas emissions. A recent study by the Ohio Department of Health confirmed that radon from the silos is not a health problem off the plant site. A radon treatment system was developed to remove radon from the silos before work was performed. In 1988, studies to better understand the condition and contents of the silos used television cameras and sampling techniques. Meanwhile, radiation levels around the silos, at the facility boundaries, and off the plant site have been regularly monitored and found to be below the health and safety limits set by the U.S. Department of Energy and the Environmental Protection Agency (EPA).

Ongoing Improvements

Planning for improved management of the contents of the silos is under way. FMPC is working with EPA to develop the next phase of stabilization plans, including steps to further reduce radon gas levels. This effort is part of the site-wide program to improve environmental performance under a DOE Federal Facilities Compliance Agreement.

The waste in the K-65 silos is a concern for FMPC management. Measures to ensure its isolation from the environment have been taken, and remedial actions are ongoing.

FEED MATERIALS PRODUCTION CENTER

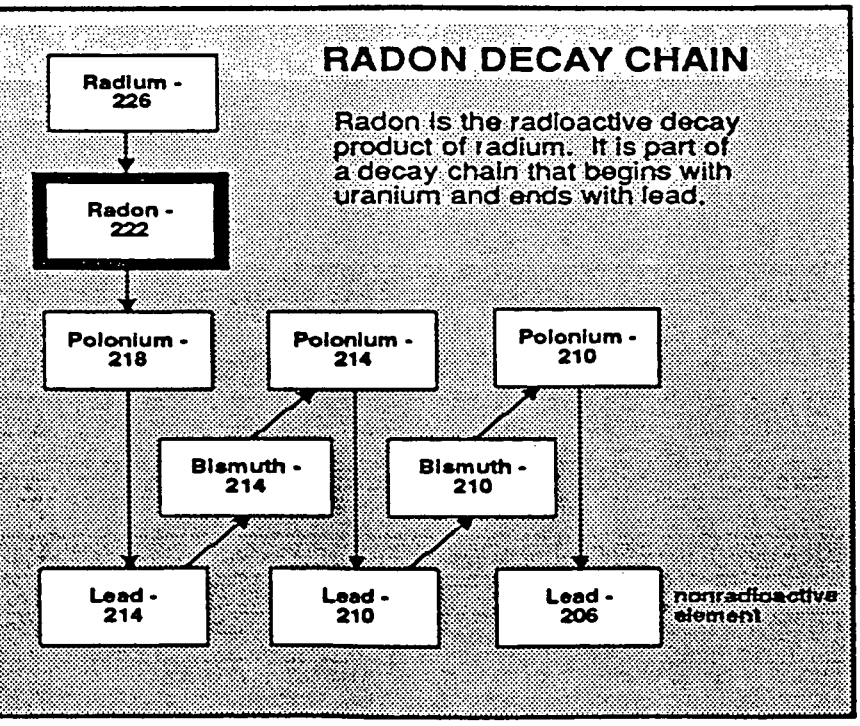
FACTSHEET

Radon

he scientific community has recently focused on radon, a naturally occurring gas that results from the adioactive decay of the element uranium. Uranium is present in small amounts in rocks, soil, water, and any common building materials. Everyone is exposed to radon because it is part of natural radioactivity hat exists all around us.

he Feed Materials Production Center (FMPC) began uranium metal production in 1953 at Fernald, Ohio. oday, two tanks at FMPC contain residues that resulted principally from processing uranium pitchblende re. These residues produce radon gases that exceed natural background levels at the tank storage site. MPC also stores thorium, a thoron-emitting element. Thoron is chemically identical to radon. (For more nformation about thorium, please see the FMPC factsheet, *Thorium.*) However, the radon and thoron given ff from storage facilities at FMPC rapidly disperse and decay to a natural background level.

n 18-month study by the Ohio Environmental Protection Agency has indicated that the radon present in omes surrounding the FMPC facility is not related to FMPC activities. In addition, independent studies by he Ohio Department of Health and the FMPC Environmental and Health Advisory Committee have onfirmed that radon from the site is not a health hazard. Even though FMPC was not identified as the source f radon in area homes, FMPC recognizes the importance of minimizing the release of radon and thoron and f providing information on radon to the public.



What is Radon?

Radon is a radioactive gas that is invisible, orderless, and tasteless. Like many radioactive substances, radon transforms into another element by a process called radioactive decay. During radioactive decay, an invisible energy called radiation is released.

Radon is a gaseous radioactive decay product of radium. Radon is part of a decay chain that begins with uranium and ends in lead. Unlike many hazardous chemicals that can linger in the environment for years, radon diffuses into the atmosphere and disperses quickly. Radon has a half-life of only 3.8 days. This means that in 3.8 days, radon loses half of its radioactivity. In another 3.8 days, the remaining radon loses half of its radioactivity, and so on. In the radioactive decay process, radon transforms into a group of radionuclides called daughter products. Inhalation of these daughter products (polonium, bismuth, lead) contributes to our exposure from radon. Microscopic particles of these daughter products can attach themselves to lung tissue, emitting strong alpha radiation, and possibly causing lung cancers. (For more information about radiation, please see the FMPC factsheet, *Radiation.*

ıdon Levels

fferent factors can cause a variation in the levels of radon to which we are exposed. The concentration radium in the soil where a building is constructed is the major factor. High levels of radon can result from ;reater radon flow rate in loose, unpacked soil; poor building ventilation; and the use of building materials at have a high radium content.

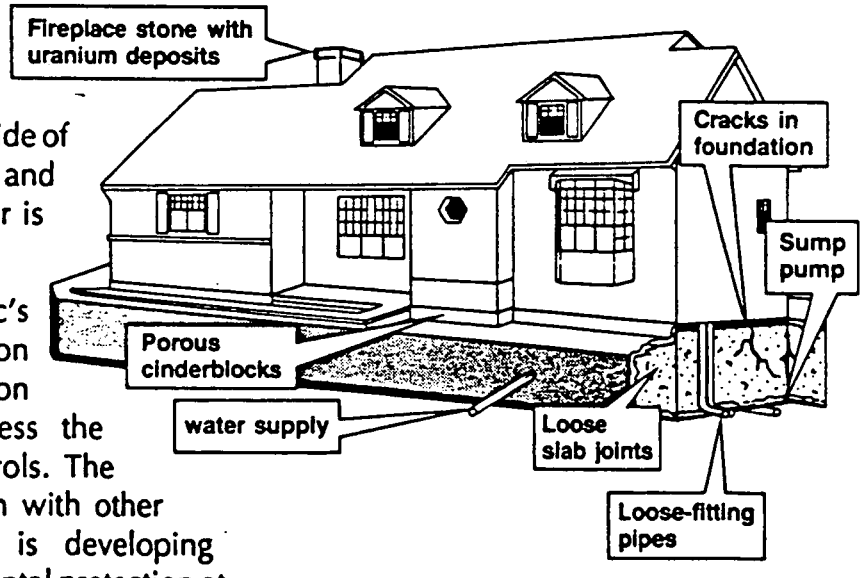
:cently, scientists have determined that the single largest source of natural radiation exposure is radon gas at can accumulate in homes and buildings. Outdoor concentrations of radon at the same locations are ually far less. Radon concentrations in building interiors is significant because Americans typically spend ıout 70 percent of their time indoors.

easuring Radon

ıdon concentration in buildings is measured by the amount of picocuries (a measure of radioactivity) of don per liter of air (pCi/L). Most homes have concentrations of radon ranging from about 0.2 to 4 pCi/L. In Ohio, from 30 to 35 percent of the homes have radon levels greater than 4 pCi/L, but two ljacent houses can have very different radon levels. Scientists have found higher than average levels of door radon in many parts of the country, including portions of Colorado, Maine, North Dakota, :nnsylvania, and Tennessee. Some buildings in Pennsylvania have radon levels as high as 100 pCi/L or ore.

ıdon Pathways Into Buildings

ıdon can enter a building in various ways. The most important pathway is through building floors and undations. A large percentage of buildings have concrete floors, which reduce the amount of radon that ın enter a building. However, cracks, joints, and openings for pipes in the concrete floor tend to decrease is inhibiting effect. Wooden ground-level ›ors in buildings provide almost no duction of radon. Scientists have recently scovered that the difference in pressure ıd temperature between the outside and inside of building can pull radon out of the ground and rough the floor in much the same way air is awn up a chimney.



The pathways shown above are possible ways in which radon may enter the home. In homes where higher than normal levels of radon are present, steps can be taken to correct the situation and reduce the amount of radon entering the home.

ИPC gives high priority to the public's vareness of environmental issues. Radon :ists at FMPC, and a comprehensive radon onitoring program is in place to assess the fectiveness of FMPC's environmental controls. The .S. Department of Energy, in cooperation with other ate and Federal regulatory agencies, is developing ›mprehensive plans to improve environmental protection at ИPC. For more information concerning radon and other ıvironmental issues, please visit the FMPC reading rooms at e plant site or at the Lane Public Library in Hamilton.

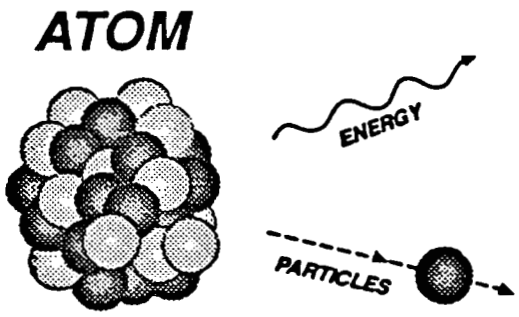
FACTSHEET Radiation

What is radiation?

Radiation is a type of invisible energy that is given off by unstable atoms. Radiation is emitted by uranium, a naturally occurring radioactive element found in the Earth's soil. Other sources like the sun, water, and even food emit radiation. Because radiation occurs naturally, everyone is exposed to certain levels of it all the time.

We also receive radiation from manmade sources such as medical x rays, televisions, luminous watch dials, and smoke detectors. After uranium has been processed at the Feed Materials Production Center (FMPC), it too is considered a manmade source of radiation.

We cannot detect radiation with our own senses. However, much research is available that explains what radiation is, where it is, and how to detect and measure the amounts we receive. This information enables necessary protective measures to be taken in handling radioactive material such as uranium.



The release of invisible energy or particles, called "ionizing radiation," is a characteristic of radioactive atoms.

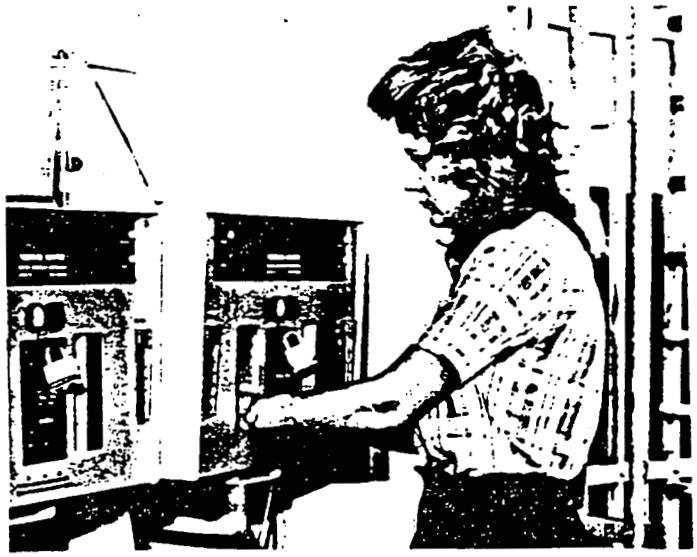
Why monitor radiation?

Radioactive materials emit invisible energy or particles that can damage living tissue. This energy is called "ionizing radiation." Most research indicates that the amount of radiation we receive from everyday sources, such as television and medical x rays, is not dangerous. Standards for radiation protection, however, have been developed on the assumption that all radiation causes some harm to the body. Therefore, radiation exposure should be kept to an absolute minimum.

Protecting Against Exposure

At FMPC many systems monitor radiation, and new monitoring equipment is being installed. One improvement is the upgrading of employee radiation dosimetry that began in 1983. Each employee carries a new type of thermo luminescent dosimeter badge that monitors individual exposure to radiation. These badges use advanced technology to accurately measure radiation exposure for each employee. Another important upgrade is the installation of an in-vivo, or whole body, counter.

The in-vivo counter will be used with the dosimetry program and other monitoring systems to determine an employee's total radiation exposure.



Personnel monitors determine if an employee has come into contact with uranium or radioactive materials.

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side the production and storage areas at FMPC, aluminum ields and rubber mats protect employees and help keep ork areas clean. In addition, a new dust collector system moves airborne uranium particles from the production area.

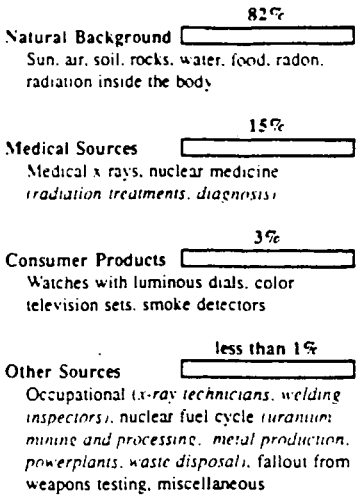
an effort to further improve radiation protection, FMPC has eveloped methods for reducing emissions of radon (a dioactive gas) from two concrete silos on site, called the K-5 Silos.

adiation Standards

he U.S. Department of Energy (DOE) standards strictly limit diation exposure for industry workers, the public, and the nvironment. Furthermore, DOE requires that its facilities eep the actual exposures as far below these limits as possible. his principle is often referred to as "ALARA" — As Low As easonably Achievable.

Sources of Radiation

Some examples of your radiation exposure



Source: National Council on Radiation Protection and Measurements NCRP Report No. 93

Varying amounts of radiation are emitted from both natural and manmade sources. Natural background radiation is the largest source of individual exposure.

MPC employees are better shielded from low levels of radiation in part due to a new radiation protection program called "Five Alive," which riginated in Plant 5 on site.

he ALARA principle is also the policy of FMPC. To continue maintaining ALARA standards, FMPC plans o continue modernizing its environmental and employee monitoring systems. Although many upgrades ave been completed, additional improvements are planned. A heightened commitment to the ALARA rinciple will help FMPC meet or exceed the established radiation standards.

FACTSHEET Monitoring

ne Feed Materials Production Center (FMPC) has manufactured uranium metal forms for the U.S. Department of nergy defense programs for over 35 years. As in most manufacturing processes, waste is produced in gas, liquid, nd solid forms.

rict emission controls collect waste for subsequent treatment or removal, keeping it from the environment. To keep missions as low as reasonably achievable (ALARA), the air, water, soil, and vegetation around the plant are onitored and sampled on a monthly, weekly, and, in some cases, daily schedule. Many types of monitoring chniques and instruments are used to sample the 1,050-acre plant site and a 5-mile radius around the site for anium, radioactivity, dissolved chemicals, and other pollutants.

Uranium oxide dust, generated in the production facilities at the Feed Materials Production Center, is controlled by a collection system and monitored continuously. Stack emissions are checked on site, at the property line, and at selected sites beyond the plant boundary.

New Technology

One of the newest instruments in the FMPC monitoring system is an environmental monitoring vehicle equipped with a mobile laboratory. This "lab on wheels" allows FMPC scientists to collect and analyze environmental samples on and off the plant site for immediate and more efficient evaluation.

About 50 new monitoring sites have been added since 1987, bringing the total to over 150 stations. Environmental sampling includes monitoring of

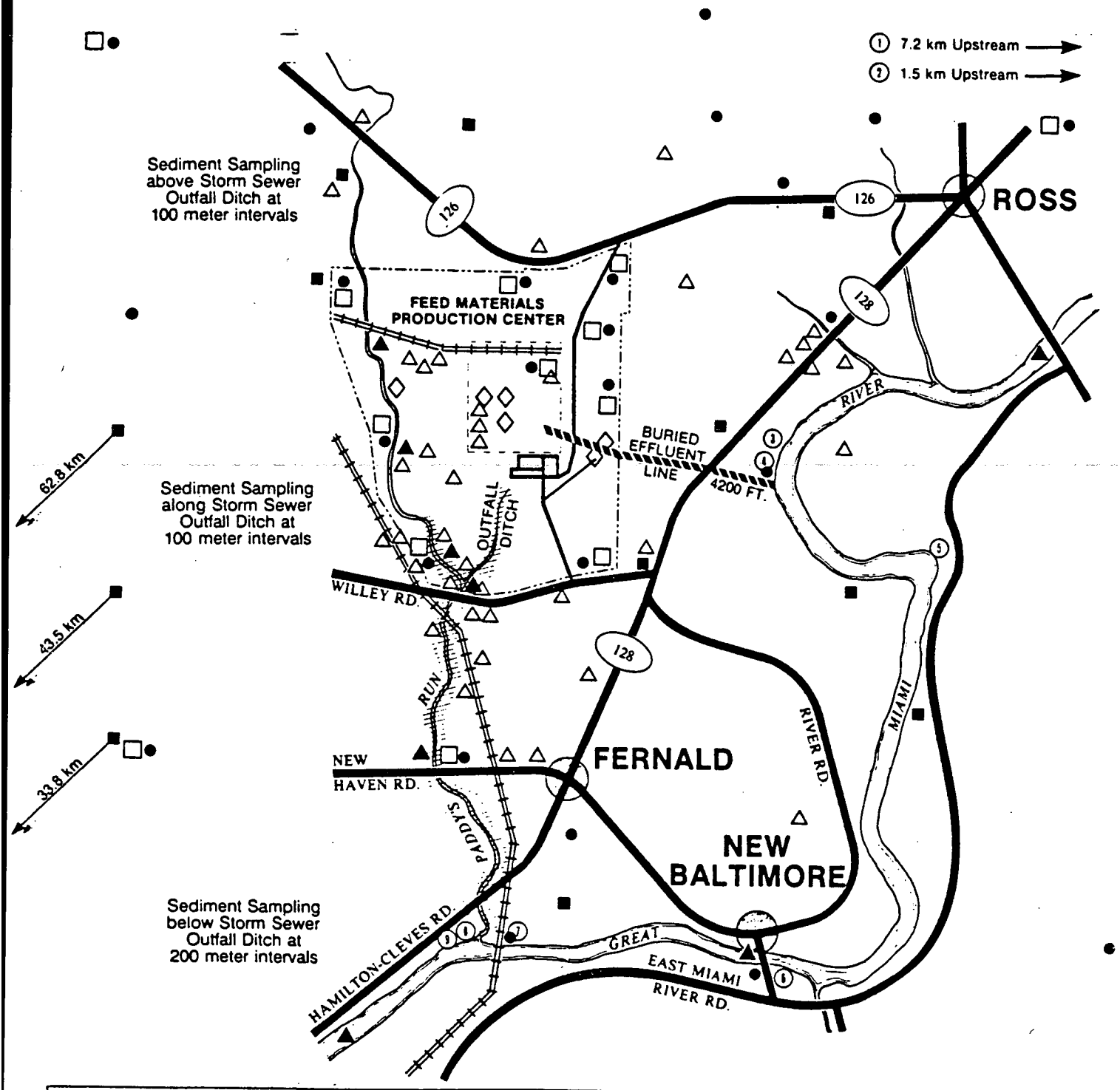
- ground water
- river and stream water
- process water
- stormwater retention basin
- air emissions
- air emission filters
- radioactivity from storage sites
- milk
- fish and wildlife
- river and stream sediments
- grass and vegetables
- soil

esults from Lab Work

aboratory technicians and scientists use state-of-the-art equipment to record and analyze air, water, soil, and egetation samples. They make monthly and yearly reports of their findings, which are available to the public. These eports show that the amount of uranium in air emissions from the plant has been greatly reduced since 1984. Similar mprovements have been made in water emissions, using a new technique that removes 96 percent of the nitrates om waste water. Samples from ground water, local streams, and the Great Miami River have detected no significant ontamination.

MPC recognizes the necessity to protect the environment by keeping emissions as low as reasonably achievable. he U.S. Department of Energy and Westinghouse are committed to meet and exceed Federal and State environmental ontrol regulations at FMPC.

Environmental Monitoring Points



A top priority for the U.S. Department of Energy and its contractor, Westinghouse Materials Company of Ohio, is to eliminate the potential for contaminating the local water, air, soil, and vegetation. An environmental monitoring system at more than 150 locations was developed to assure the quality of FMPC's waste treatment procedures. This map shows the locations of the environmental monitoring points.

FEED MATERIALS PRODUCTION CENTER

FACTSHEET

Thorium

Thorium is a naturally occurring, radioactive element. Thorium has been stored at the Feed Materials Production Center (FMPC) since the mid-1960s when the United States was studying the use of a thorium/uranium fuel cycle for commercial production of electricity. Approximately two-thirds of the thorium at FMPC was processed on site, with the remaining portion originating from other DOE facilities. Over 1,316 metric tons of thorium is stored in silos and steel drums at FMPC.

The stored thorium is a mixture of thorium metal, thorium oxides, and residues. Thorium metal is silvery white and has approximately the same density as lead. Much of the stored thorium metal has reacted with oxygen and developed an oxidized surface. Thorium oxide is a white powder that is five times as dense as dried concrete, though not as dense as thorium metal.

FMPC is taking immediate action to improve its thorium storage facilities. After being repackaged for safe storage, thorium containers are checked for radioactivity.

About Thorium

Thorium is common in nature, about three times more abundant in the Earth's crust than uranium. It is found in soil around the world but is most concentrated in the sands of India, Brazil, and Ceylon. Thorium deposits are located in several areas of the United States including Florida, Idaho, and the Carolinas. Chemical treatments, such as extraction and crystallization, are used to process thorium-bearing sands to prepare it for industrial use.

Uses of Thorium

Thorium was originally developed for use in manufacturing mantles for gas lamps. As electric lighting replaced gas lighting, the commercial demand for thorium declined to the current rate of about 1,000 pounds a year. Thorium is now used in gas lanterns for camping. Mantles for these lanterns are about 99 percent thorium dioxide. Small amounts of thorium are also used as an additive to produce metal alloys that are strong, lightweight, and heat resistant. Such metals are commonly used in aircraft engines and airframe construction.

In a nuclear reactor, thorium can be converted to a form of uranium that can be used as a nuclear fuel. The use of a thorium/uranium fuel cycle was studied extensively in the 1960s for its potential as an efficient energy source. Most of the thorium now stored at FMPC was originally slated for use as part of the thorium/uranium fuel cycle.

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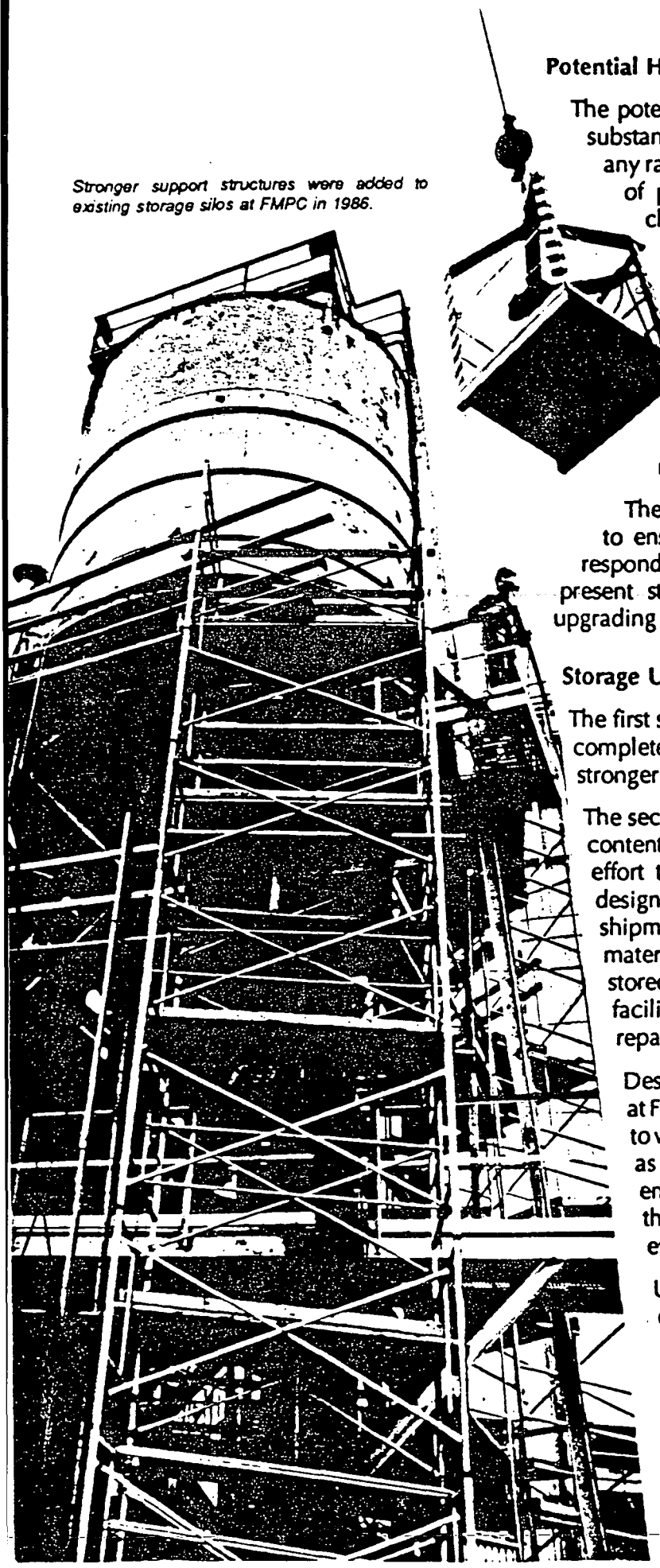

Stronger support structures were added to existing storage silos at FMPC in 1986.

Potential Hazard

The potential radiation hazard of thorium at FMPC makes the substance an environmental concern for management. Like any radioactive element, thorium gives off energy in the form of particles and rays of radiation and, in the process, changes to other elements. This process is called radioactive decay, and the resulting elements are called daughter products. One of the daughter products of thorium is thoron, a radioactive gas that is chemically identical to radon but much shorter lived (56 seconds compared with 3.8 days). Thoron is continuously generated by the stored thorium. Other daughter products also emit radiation. Because radiation presents a health hazard, exposure to it is kept to a minimum.

The stored thorium at FMPC requires careful management to ensure safety and isolation from the environment. To respond to this need, FMPC has taken action to improve the present storage facilities and is making long-term plans for upgrading the plant's storage capabilities.

Storage Update

The first step to ensure the safe storage of thorium at FMPC was completed in 1986 when the existing silos were reinforced with stronger support structures.

The second step in the storage upgrade included sampling the contents of the silos in preparation for the major repackaging effort that began in 1988. Storage containers have been designed to contain the thorium for long-term storage or for shipment. A system has been designed for overpacking the material in larger containers that will be inventoried and stored at FMPC pending final disposition. Containment facilities were erected to control emissions during the repackaging effort now underway.

Designers of the new technology for thorium management at FMPC are guided by the principle that radiation exposure to workers, the public, and the environment should be kept as low as reasonably achievable—ALARA. An environmental monitoring system continually samples the air around the isolated and secured storage site for evidence of increased radiation levels.

Upgrades in thorium storage technologies reflect the cooperative efforts of the U.S. Department of Energy and State and Federal regulatory agencies to improve the environmental protection at the site. Careful planning and action are the cornerstones of the program to control the storage and handling of thorium at FMPC.

FACTSHEET

Waste Management Vocabulary

Over the past two decades, work in the environmental management and response area has created a unique vocabulary of laws, regulations, and terms. Listed below are some of the terms and definitions that are most important at the Feed Materials Production Center (FMPC).

ALARA — **As Low as Reasonably Achievable.** A principle followed by all U.S. Department of Energy (DOE) facilities. Rather than simply following regulations, DOE strives to keep radiation exposure to workers and the public as low as reasonably achievable.

BDN — **Biodenitrification.** A waste treatment process that uses natural bacteria to "eat" nitrates. FMPC has a BDN facility that has significantly reduced the nitrate content of FMPC discharge.

BOD — **Biological Oxygen Demand.** A measurement of the oxygen available for organisms to use in waste water discharge. This is one of the standards regulated by the National Pollution Discharge Elimination System (NPDES).

CEQ — **Council on Environmental Quality.** A government council that oversees implementation of the National Environmental Policy Act (NEPA).

CERCLA — **Comprehensive Environmental Response Compensation Liability Act.** Commonly known as Superfund, this law gives the U.S. Environmental Protection Agency (EPA) the authority to respond to releases and threats of releases of hazardous substances from containers and facilities. It was passed in 1980.

CIS — **Characterization Investigation Study.** A study to identify and quantify contents of a waste site. A detailed CIS has recently been performed on the FMPC waste pit area.

Consent Decree — An agreement between the State of Ohio and DOE specifying actions to be taken to make environmental upgrades at the site. Two consent decrees were signed in December 1988.

DFOs — **Director's Findings and Orders.** A set of environmental directions handed down to FMPC from the Director of the Ohio Environmental Protection Agency (OEPA). These directions require various environmental improvements that are now being implemented at FMPC.

EIS — **Environmental Impact Statement.** A document that provides a comprehensive assessment of the effect of a proposed action on the environment. An EIS is being written assessing the environmental impacts associated with FMPC renovation and major remedial action activities.

EPA — **Environmental Protection Agency.** The Federal agency responsible for regulating most environmental problems.

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FFCA	**Federal Facilities Compliance Agreement.** An agreement signed in 1986 between DOE and the EPA. It regards the compliance of DOE facilities (including FMPC) with environmental regulations.
NEPA	**National Environmental Policy Act.** Passed in 1970, NEPA makes it Federal policy that all practical measures will be used to create and maintain conditions under which man and nature can exist in harmony. The U.S. Department of Energy will have the responsibility and authority for issuing a Record of Decision for remedial activities under NEPA.
NPDES	**National Pollutant Discharge Elimination System.** A system established by the EPA under the Clean Water Act to issue permits for the discharge of any pollutant(s).
NPL	**National Priority List.** A list of sites to be evaluated for remedial action under CERCLA.
OEPA	**Ohio Environmental Protection Agency.** The State agency responsible for regulating environmental concerns in Ohio.
RCRA	**Resource Conservation and Recovery Act.** This law, passed in 1976, set standards for the handling of hazardous wastes.
RI/FS	**Remedial Investigation/Feasibility Study.** A study that characterizes environmental problems and outlines remedial actions to solve those problems. An RI/FS is currently underway for the FMPC site and adjacent areas. EPA has the responsibility and authority to issue a Record of Decision for the remedial activities.
RMI	**Reactive Metals Incorporated.** A company that has worked in the past with ingots and billets produced at FMPC. The RI/FS being developed for FMPC also covers the RMI facility in northern Ohio.
ROD	**Record of Decision.** A written decision made on whether to permit an action (e.g., when an EIS is submitted).
SARA	**Superfund Amendments and Reauthorization Act.** A law passed by Congress in 1986 to strengthen and extend the provisions of CERCLA. The act covers a broad range of emergency response and cleanup provisions.
TSS	**Total Suspended Solids.** A measurement of solid materials suspended in waste water discharge. TSS limits are enforced by the NPDES.

FACTSHEET

Uranium

Uranium is a naturally occurring, radioactive element. It is common in nature, about 100 times more common than silver. Like silver and other metals, uranium is mined from the earth. The soil in most areas of the United States contains traces of uranium, but certain areas have concentrated deposits that are economical to mine. Rich deposits are found in the western United States. There, uranium is found in concentrations of 2 to 3 pounds per ton of ore.

Uranium ore is mined in much the same way as coal, either by surface or underground techniques. The mined ore is crushed and ground into a fine sand, and the uranium is removed from the ore. This process is called milling.

Uranium ore is mined by surface or underground mining techniques.

Natural uranium occurs in different forms, or isotopes, which are designated by their atomic weights. The most abundant form is uranium-238 (U-238), which makes up 99.3 percent of natural uranium. The remainder includes uranium-235 (U-235). U-235 is the isotope that is useful as nuclear fuel for commercial powerplants.

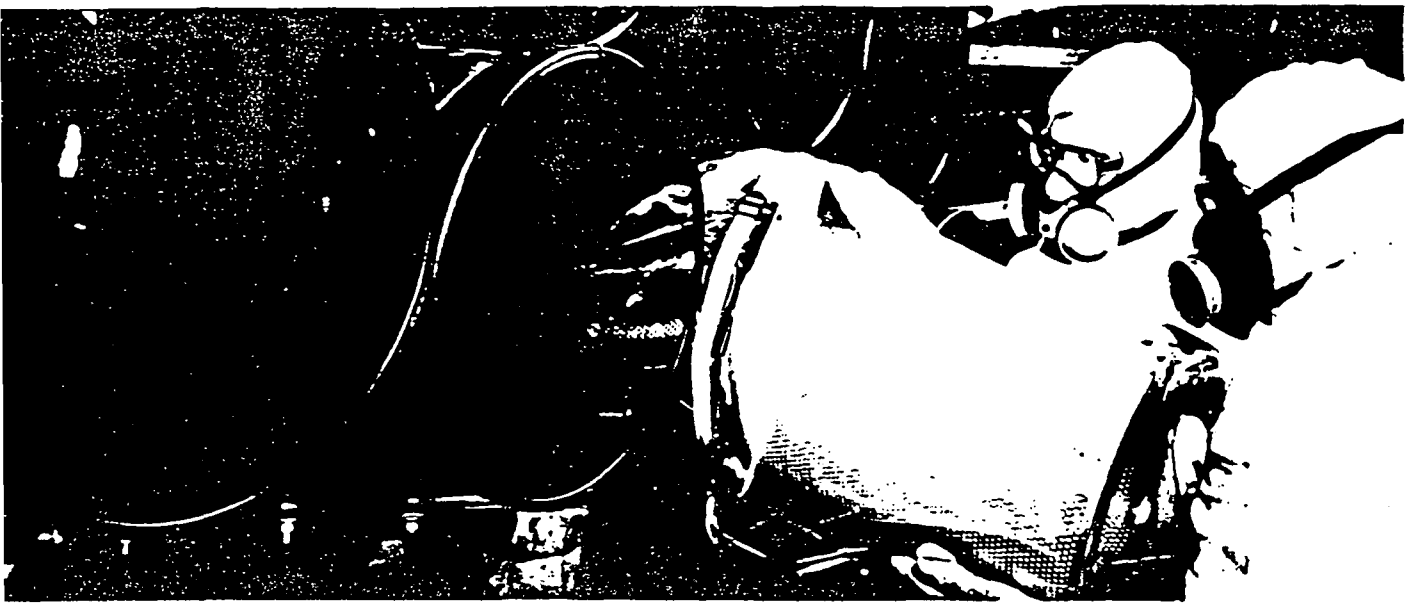
Uses of Uranium

When uranium was discovered as a distinct element in 1789, it was more a laboratory curiosity than a useful mineral. As scientists studied the element, however, they realized that under precisely controlled conditions, uranium atoms could be split to produce energy.

Today, uranium is widely used as fuel to generate electricity and in the production of medical isotopes. It is also used as a feed material to produce plutonium, a necessary material in nuclear weapons for the National defense program.

Uranium at FMPC

Operations at the Feed Materials Production Center (FMPC) involve the processing and handling of uranium metal and uranium compounds. Uranium can be depleted, which means it has a much smaller percentage



tective clothing and equipment minimize the exposure of FMPC employees to uranium particles when air filters are changed.

U-235 than the 0.7 percent found in natural uranium, or enriched, which means the U-235 content is ater than 0.7 percent.

IPC previously processed both slightly enriched (usually about 1 percent U-235) and depleted uranium. ly depleted uranium is processed now. Both types have very low levels of radioactivity. This uranium ast and machined at FMPC, then sent to other U.S. Department of Energy (DOE) facilities for use as feed terials in the National defense program. FMPC produces no explosive devices, weaponry, or highly lioactive products.

anium and Safety

e uranium at FMPC is both a slightly radioactive and chemically toxic material. Uranium can be either uble or insoluble. The hazard it presents depends on which form it is in. Soluble uranium can be absorbed o the bloodstream if swallowed or inhaled. Eventually, it may be deposited in body tissues where it may y for a month or more. Soluble uranium makes up less than 10 percent of the total uranium processed FMPC.

ost of the uranium handled at FMPC is insoluble. Insoluble uranium is not readily absorbed into the odstream and passes quickly out of the body after it is ingested. Insoluble uranium usually poses little zard of radiation exposure or chemical toxicity. If insoluble uranium is inhaled, the hazard is more serious. oluble uranium deposits in the lungs do not pass out of the body quickly and may damage lung tissue.

detect the presence of radioactive materials anywhere in the body, including the lungs, employees are amined at the plant site in one of world's most advanced in vivo monitoring facilities. In vivo monitoring ults from 1989 have shown that only 2 percent of the employees tested have uranium in the body, and ose levels were so low that they were barely detectable and were not considered a health risk.

cautionary measures are taken at FMPC to ensure maximum protection of the workers, the environment, d the surrounding community. These safety measures include continual environmental monitoring, ular inspections, and inventory control.

ce its discovery, uranium has been intensely studied, and today its qualities are well known and derstood. Responsibly used, this element offers industry and National security an essential and valuable terial.

FEED MATERIALS PRODUCTION CENTER

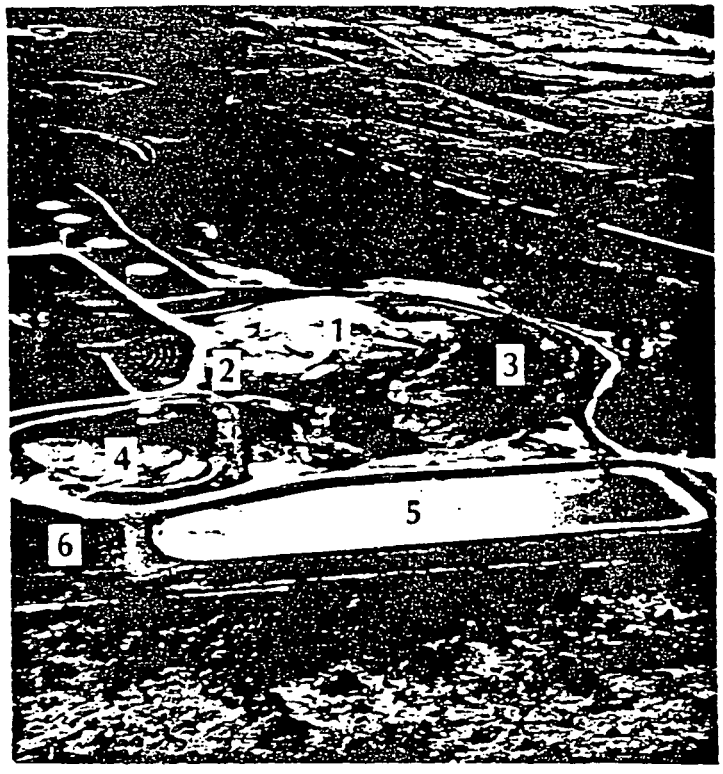
FACTSHEET

Waste Pits

ıe Feed Materials Production Center (FMPC) has begun an extensive program to ensure the safe anagement and final disposal of waste materials. Past waste management practices included the storage low-level radioactive wastes in six shallow-ground waste pits. At the time, the use of pits for waste storage as consistent with environmentally acceptable standards. However, because of the pit design, the nature the waste involved, and their potential to affect ground water, these pits are not considered permanent sposal facilities. Today, wastes are no longer being placed in the pits, and studies are under way to :termine how to best manage and ultimately dispose of the materials now stored there.

ɔout The Waste Pits

ıe six waste pits at FMPC range in size from that a football field to a baseball diamond and vary ɔm 13 to 30 feet deep. Most of the waste aterials in the pits contain small amounts of anium resulting from the FMPC production ocess. These materials had uranium and orium concentrations that were considered o low to be economically recovered for cycling. There are approximately 475,000 ns of this waste in the pits.



'aste Pits 1, 2, and 3 have been covered with psoil and are not in service. Pit 4 is a dry waste ɔrage pit that is out of service and covered with ater-resistant bentonite clay as an interim osure method. Closure will be completed in)89 with the installation of a synthetic cover. t 5, a rubber-lined pit, is a wet chemical ɔrage area and is filled to capacity. Pit 6, also rubber-lined pit, was used primarily for dry aste storage and is now out of service. Pit 6 is)proximately 75 percent full.

Waste Storage Pits

Waste Pit	Type	Waste Quantity (Metric tons)	Status	Contents
1	Dry	40,500	Out of service	Misc., Dry
2	Dry	13,000	Out of service	Misc., Dry
3	Wet	255,000	Out of service	Misc., Wet
4	Dry	64,970	Out of service	Abrasives, Metals, Dry
5	Wet	88,603	Out of service	Misc., Wet
6	Dry	9,309	Out of service	Wet and Dry

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emedial Actions

addition to cleaning up the waste pits, new technology and approaches are being used to minimize the aste that is generated. Currently, low-level radioactive waste from production is packaged in drums or her containers and stored at FMPC or shipped off site. Steps are now being taken to reduce the amount production waste, and a greater emphasis is placed on waste recovery and recycling.

igineering studies have been initiated to identify solutions for waste pit material management and disposal. vo independent environmental and analytical firms have been enlisted to evaluate problems and to help velop solutions.

Dames and Moore, contracted to perform hydrological studies at FMPC, concluded in early 1986 that the waste pits present a potential for ground water contamination in the FMPC area. A waste pit area surface water runoff task force was formed to recommend interim measures to control surface water infiltration that may contribute to this problem. These measures include diverting, collecting, and treating stormwater runoff through the Stormwater Retention Basin.

Another contractor, Roy F. Weston, Inc., analyzed the chemical, physical, and radiological contents of the waste pits and the area surrounding the pits. A report on this Characterization Investigation Study was completed in December 1987.

Under a Federal Facilities Compliance Agreement by the Department of Energy, the FMPC site will comply with regulatory standards of the Environmental Protection Agency.

As part of the pit study, Weston analyzed Pit 4 in order to comply with the Resource Conservation and Recovery Act. This pit contains some low-level radioactive waste that is also contaminated with various hazardous materials. Therefore, additional regulations now govern the measures to be taken when the waste from this pit is removed.

ow and The Future

ne overall objective for all FMPC operations is to prevent the recurrence of past problems and to avoid new oblems. The U.S. Department of Energy, in cooperation with State and Federal regulatory agencies, is veloping plans to improve the environmental protection at the site. The goal is to transform this 38-year-d facility into a site that is in step with present and future environmental requirements.

ATTACHMENT C

DETAILED SUMMARIES OF WORKING SESSIONS AT THE JANUARY 31, 1989 FMPC RI/FS COMMUNITY MEETING

ATTACHMENT C

DETAILED SUMMARIES OF WORKING SESSIONS
AT THE JANUARY 31, 1989
FMPC RI/FS COMMUNITY MEETING

Whereas the meeting summary at the beginning of this report summarizes the question-and-answer sessions by main topics covered, this attachment provides a record of actual interchanges that occurred during those sessions. The sessions were held simultaneously. Each interchange was recorded by the assigned recorder, as described in the meeting summary. The report on each session has been reviewed to ensure its technical credibility and to represent an accurate accounting of what transpired. [Explanations added to clarify individual questions or answers are enclosed in brackets.]

AIR ISSUES

The panelists--Gerry Gels, health physicist; Bryan Speicher, engineer; and Tom Walsh, professional meteorologist--were introduced before questions from meeting participants were answered.

Q. One person expressed the feeling of being lied to in regard to environmental issues at the FMPC; specific examples cited were the closing of the scout camp and handling of hazardous chemicals.

A. Graham Mitchell of the Ohio EPA responded that, regarding the scout camp closing, the conservative answer is that it was not a U.S. EPA recommendation. Without a guarantee that there would be no environmental problems, the camp operator closed the camp.

Q. How do you handle this chemical and radioactive material stored on site?

A. The last shipment of chemicals that had been stored on the site was made in January.

Q. Are other materials stored on the site?

A. Miscellaneous radioactive waste is stored in 55-gallon drums on the site. One of the projects facing WMCO is to classify the waste that is stored on site.

Q. What types of air pollution can leave the plant?

A. Particulate uranium carried by gas discharges expelled into the air.

Q. Are gases escaping the silos or pits?

A. The RI/FS shows no evidence of release from silos or pits at this time.

Q. How far from the plant are the air monitoring stations?

AIR ISSUES (continued)

A. The air monitoring stations are at the site boundaries andapproximately two to three miles away. Samples are taken continuously and the filters are analyzed weekly to determine any uranium contamination present.

Q. What a does light burning in a monitoring station indicate?

A. The light indicates a problem with the meter, pump, or filter. It means that the monitoring station has a fault and is not collecting an air sample.

Q. What were the results from the air monitoring station?

A. Above-background readings were detected on-site and at the Elda School monitoring station during the Plant 2/3 episode. Plant 2/3 was shut down when the problem was found; the plant is still down.

Q. What is being done to evaluate discharge levels from the FMPC?

A. The FMPC Publication 2082, issued in 1988, discusses these topics. Records, reports, memos, and annual reports, as well as the Oak Ridge Associated Universities' Report of 1985, are available for review.

Q. Does the ORAU [Oak Ridge Associated Universities] report provide discharge results?

A. This report has been updated a number of times. No intent to deceive the public has been intended with the changes in the release numbers. They are only trying to provide the best estimate possible.

Q. Will release information be available in March 1989? Will this provide the most accurate estimate of contaminated releases from the National Centers for Disease Control (CDC) to determine if a health hazard exists?

A. It is scheduled for a March 1989 release.

Q. Will studies be made of the people living near the plant site as to the health hazards expected?

A. After the report of emissions is released, the National Centers for Disease Control will determine if the public needs to be tested.

Q. What kinds of emissions can be hazardous?

A. Hazardous emissions would include uranium and chemicals such as ammonia, hydrogen fluoride, nitric acid (nitrous oxide). Important factors in evaluating hazards include amounts, concentrations, and locations of releases.

Q. Are ammonia releases at the plant a problem?

AIR ISSUES (continued)

A. [Procedures are in place to monitor ammonia. For example, the] tanks are inspected by each shift of workers. Levels of ammonia are monitored. Another monitoring aid is ammonia odor--the product can be very easily detected by smell.

Q. What plans does DOE have in the event of an emergency?

A. Monthly meetings are held for emergency response personnel, i.e., fire departments, schools, plant personnel. The plan for emergency response identifies how local authorities will be contacted in an emergency.

Q. How is the distance of uranium "travel" monitored?

A. Air monitoring is a continuous process. Theoretical studies were performed to determine where to position additional stations (sites 8 and 9) for maximum coverage of potential problems.

Q. Has a study on the health effects on people been done?

A. All the estimates are being done at this time for the estimated Air Discharge Report due in March 1989. It is difficult to say that there are no effects but the relationship between the emissions and health effects will be determined by CDC.

Q. What are the distances of air monitoring stations from the plant?

A. The distance of the Elda School Air Monitoring Station is 2-1/2 miles. One of the fact sheets shows the locations of air monitoring stations.

Q. What happened to the material released prior to WMCO's taking over plant operations? Where did it go?

A. We don't know, but the great majority of it is probably still on site since uranium is so heavy.

Q. How can you tell after 23 years of drinking the water if any of this material has entered the body?

A. A Whole Body Count would have to be done. To arrange for that, contact the University of Cincinnati.

Q. On the K-65 silos, there is a sign that says do not walk on the dome. What happens if a storm damages the silos and there is a release?

A. The structure of the silos is sound. The material is not in a dust form.

Q. This is the only plant that produces the high quality of uranium rods for the country's defense. Why is the EPA trying to close it?

AIR ISSUES (concluded)

A. EPA is not involved in plant shutdown talks. Discussion has been based on the 2010 Report prepared by DOE contractors. The RI/FS is being performed by DOE contractors with U.S. EPA and Ohio EPA oversight to protect the public.

Q. Will the Estimated Air Discharge report in March 1989 specify particle size?

A. The report will estimate the amount of release but will not estimate particle size. In the past, a particle size of five to six microns (AMAD) has been estimated.

Q. [How effective are] the cap and soil around the silos? Why put the waste [from the FMPC] in New Mexico? Could five inches of snow collapse the [K-65] dome?

A. The cap and soil reduce the dose rate. Storage of waste in New Mexico [at the Waste Isolation Pilot Plant, or WIPP] would be in an underground area with no water. [No answer was given regarding the structural stability of the dome.]

Q. How safe is Fernald?

A. Mr. Gels responded that if he believed it were not safe, he would not be working there.

Q. Do the monitors indicate what materials have been released?

A. The monitors collect particles in the air that do not pass through the filter. Those particles present then undergo isotopic analysis.

Q. Will air monitoring data be released to the public?

A. Yes. The annual report is available from WMCO's public affairs office. It includes information on winds and on uranium concentrations at the air monitoring stations.

FMPC ENVIRONMENTAL IMPROVEMENTS

The FMPC Environmental Improvements session was staffed by Bob Kispert, manager of waste remediation and environmental engineering; Andrew Macaulay, manager of capital projects; and Mary Stone, RI/FS Project Manager. Bob Kispert made a brief presentation on the major environmental restoration activities underway at the FMPC, including the stabilization of the K-65 silos and the pit interim closure. The presentation was followed by a question-and-answer period which is identified below.

Q. Why are the K-65 silos there? I worked there and know that the uranium was taken out of the material. What's in there? I know that there is no contamination.

A. That is an independent opinion. Pitchblende was a high-quality material processed in the refinery to remove the uranium. It was obtained from the Belgian Congo; it contained gold, silver and uranium. The remaining products were put in the silos.

FMPC ENVIRONMENTAL IMPROVEMENTS (continued)

Q. If Fernald shut down, would there need to be a replacement facility?
A. Somewhere, yes.

Q. DOE didn't show concern for the environment for 30 years; why does it now?

A. We can attest to a more concentrated interest now with a local DOE office. We are all concerned and committed. There is a much higher level of support and more monies. Fernald is number one on the list of sites to clean up.

Q. If a tornado hit the silos, how far would the material spread?

A. Risk assessments have been done. [The recorder's notes indicate this to be the complete anwer to this question.]

Q. Has the FMPC already removed half of its barrels?

A. A large portion of them have been removed.

Q. Is the FMPC still in production?

A. Yes, at least through 1994. The RI/FS will proceed independently whether we continue to produce beyond 1994 or not. The U.S. government works on a five-year planning basis. This is the current plan. The DOE 2010 Report tries to project beyond 1994.

Q. The Oak Ridge Associated Universities studies have criticized site environmental monitoring. What has been done to improve the situation?

A. There are displays here tonight on water and air monitoring for your information on those topics. [The recorder's notes indicate this to be the complete answer to this question.]

Q. What will be the mode of transporting contaminated materials?

A. This is yet to be determined. It depends on the study and its determinations of what is to be removed. We will not be permitted to use the local railroad if it is [deemed to be] unsafe.

Q. How will you obtain additional monies?

A. DOE budgets and requests funds through the DOE. DOE does not depend on Superfund money for this project.

Q. Where does the Superfund money come in?

A. It is used when the particular party responsible is hard to access.

Q. My concern is that you will shut down the plant and forget it.

FMPC ENVIRONMENTAL IMPROVEMENTS (continued)

A. We have additional money to operate with. We operate under four to five government funds such as uranium production, cleanup, capital projects. If production stops and the money stops, the commitment is still there to clean up. [We are committed to EPA and to abide by their decisions].

Q. What has been done to remediate the pits?

A. Pit 4 has an interim RCRA cap and no additional contaminated materials are being added to any of the pits. Final remediation of the pits, an operable unit of the RI/FS, [will be addressed in the FS].

Q. Aren't we wasting money if we don't have a place to send the waste?

A. We are not yet prepared to answer these questions; we are here to discuss what has already been done. We need to look at all alternatives. We want to do it right.

Q. Where can I get a copy of the FFCA [Federal Facilities Compliance Agreement]?

A. It is available in the reading rooms [in the Lane Public Library in Hamilton and in the Administration Building of the FMPC].

Q. Do you feel the need to pump out the pits?
A. That will be addressed during the operable unit Feasibility Study for the waste pits.

Q. What is stored in the pits?

A. Depleted uranium waste is in Pit 4, as well as graphite and concrete. The pits are lined to prevent future leaks. [Discussion of the contents of the other pits was not included in the recorder's notes.]

Q. Do you recommend cleaning out wet pits?

A. This will be determined and decided by the U.S. EPA after characterization and the determination of alternatives.

Q. Did the foam on the K-65 silos work?

A. Yes, air above the material was withdrawn and clean air recycled back over eight to nine hours. Radon was reduced down to very low levels. This was done in November and completed in December of 1987.

Q. Are you considering plant shutdown in 1994 as the DOE 2010 Report mentions? How has this influenced you?

A. We have moved up some projects. The report also emphasizes continual cleanup of these sites.

Q. What's the reason for shutdown?

FMPC ENVIRONMENTAL IMPROVEMENTS (concluded)

A. It is an economic consideration. There is a drop in demand for our products. We are looking for cheaper alternatives. We still have not seen the entire DOE 2010 Report -- just the executive summary. We know how to clean up but must answer the question, "What is the best way to spend the taxpayers' money?"

Q. Why is the FMPC producing products again when we don't need the products?

A. DOE planning is done on a systematic basis. There is not a demand for our products but there are options for DOE to go elsewhere. Enriched uranium production has been completely stopped.

Q. What materials are on site? Is anhydrous ammonia still used?

A. The anhydrous ammonia is gone.

Q. What is the time frame for completing the storage of materials?

A. There is a continuous process of repackaging the barrels and sending them off site. It is a very systematic process of identification or weighing the materials.

Q. How long do your records cover?

A. Since the beginning; there is accountability. We have records on drums from the very beginning.

Q. We've already had an environmental impact statement; why do we need another one?

A. The first dealt with improving equipment and modernization. [The recorder's notes indicate no further explanation of the EIS, in response to this question.]

Q. How much money is going for research?

A. We are very interested in using the technologies throughout DOE. [No dollar amount was recorded.]

Q. Does the U.S. EPA have the final say about the cleanup?

A. DOE will recommend procedures for cleanup and U.S. EPA will have the final say. After U.S. EPA reviews the RI/FS findings, their recommendations will be made public. People may review the RI/FS document and then express their comments. U.S. EPA will take these comments into consideration as they make their final decision.

Q. It takes 90 days just to read it [the RI/FS]?

A. We are trying to break it down so it will be more manageable and more palatable [to the public].

SURFACE WATER ISSUES

Sally Clement, geologist, introduced her two co-panelists--Dave Brettschneider, project engineer, and Joe Yeasted, RI/FS technical manager--and their respective positions in relation to the surface water issues. She then solicited questions from the audience.

Q. What were the results of the surface water studies?

A. A diagram was used to illustrate the surface water sampling locations used by WMCO for routine compliance monitoring, as well as the additional locations being sampled as part of the RI/FS. The results of the monitoring programs have been generally consistent. Limited increases in uranium levels have been observed very near the discharge points from the FMPC.

Q. What are the background levels of radium and uranium in the Great Miami River? Are these values consistent with background levels reported by U.S. EPA?

A. The panelists reported that the background level, defined as the average concentration at the upstream monitoring station, was 1.2 micrograms per liter for 1987 and generally remains close to this value [today]. No one knew what the U.S. EPA would consider as background, but the panelists clarified that their definition of "background" is the concentration in the Great Miami River upstream of the point at which the FMPC would have an effect. This background value is consistent with background levels used by U.S. EPA.

Q. Has there been a change in background levels over the years?

A. The background value varies over a small range from year to year, but has remained relatively consistent throughout the years of monitoring.

Q. How do the levels observed in the river compare to levels that would present a health risk?

A. The proposed U.S. EPA standard for drinking water is 30 picocuries per liter. The background value of 1.2 micrograms per liter is the same as about 0.8 picocuries per liter, which is many times less than the proposed standard for drinking water. This would indicate that the risk would be less than a 1×10^{-6} risk level, which represents a level at which one excess cancer would result in a population of one million people.

Q. Are any bodies of water at higher levels of contamination than background, such as Paddy's Run?

A. The Great Miami River has uranium levels of approximately 5 micrograms per liter at monitoring points closest to the discharge point of the FMPC effluent. This is quickly reduced by mixing and dilution in the river. No RI/FS data are yet available on Paddy's Run since the stream has been dry [since last summer]. The first set of samples were recently collected but have not yet been analyzed. In the past, uranium levels have fluctuated considerably depending on the relative amounts of streamflow and FMPC discharges. The levels in Paddy's Run would typically be higher than [levels] in the Great Miami River.

SURFACE WATER ISSUES (continued)

Q. Is water from the FMPC still entering the Great Miami River?

A. Yes, from three principal sources. The treated effluent from the plant still enters the river through a permitted discharge pipeline. Second, storm water runoff is pumped to the river after retention [to remove solids] in the storm water basin. Finally, surface water runoff that enters Paddy's Run eventually enters the Great Miami River.

Q. Is overflow to the river possible as a result of heavy rains?

A. Yes. The storm water retention basin holds 10.2 million gallons, which is sufficient to store the runoff from a severe storm that has a 10 percent chance of occurring in any given year. If a larger storm occurs, then overflow would result. Note that any overflow would have to pass over the entire length of the basin, so some settling would still occur.

Q. If solids in the overflow water continue to settle, how do you know they are not running into the Great Miami River?

A. The water first enters Paddy's Run and would tend to settle out there. WMCO monitors the sediments in Paddy's Run and has done so for years. The RI/FS will provide additional monitoring data and will recommend what, if any, corrective action is necessary.

Q. Contamination may not be bad now, but what will five years do?

A. The storm water retention basin has been in operation for more than two years. Obviously, more contamination reached the river in previous years. We can only speak to current releases and the attempts to deal with these releases.

Q. Will the contaminated ground water under Plant 6 go to anyone?

A. We believe that the contaminated water has been trapped by the clay till that underlies Plant 6. Monitoring wells have been installed in the sand and gravel aquifer to detect if any contamination has entered the ground water before the ground water goes off site.

Q. The till is very thin in this area--why do you think it can stop this water?

A. The till is thin, and in fact, nonexistent, in many areas near the FMPC. However, the FMPC is on a bluff that represents a thick till layer. The thickest layer of till, approximately 30 feet, underlies the Production Area and Plant 6. Studies recently conducted near the coal storage pile show the permeability of the till to be extremely low.

Q. Considerable amounts of "black oxide" were picked up by storm water runoff--how far will water carry this material?

A. We don't know the answer to that question. However, the purpose of the storm water retention basin is to allow the settling of such solids prior to their release to the stream and river. The degree of solids removal is controlled by the limits established by the State of Ohio under the National Pollutant Discharge Elimination System.

SURFACE WATER ISSUES (continued)

Q. Has beta radiation been found in wells?

A. Less than 4 picocuries per liter have been found.

Q. Are any wells shut down?

A. Yes. One well to the south of the FMPC was taken out of service due to high levels of uranium in the water.

Q. What will drinking water containing elevated levels of uranium do to our family?

A. Drinking two liters of water per day of the most contaminated ground water near the FMPC for a year would give about the same exposure as two chest X-rays. However, such water is not, to our knowledge, being used for drinking water at this time. No wells used for drinking water are known to contain uranium at levels that exceed the proposed U.S. EPA drinking water standard.

Q. What is the level in the worst wells?

A. The highest levels are approximately 300 parts per billion (micrograms per liter) of uranium.

Q. If the till on-site is impermeable, how did contamination (in the ground water) get out of the plant boundaries?

A. The till becomes very thin on the southern end of the FMPC property, and disappears in Paddy's Run due to the deep erosion channel. We now believe that contaminated water entered the drainage ditches and Paddy's Run, and then infiltrated through the bottom of the drainages and into the underlying ground water in those areas where the till is thin or absent.

Q. Is that how you know that ground water contamination was not caused by the pits?

A. Some ground water contamination is believed to be the result of leakage from the pits, but not the uranium in the ground water south of the FMPC. The fact that ground water contamination has occurred beneath the pits even though the till is present in that area can be explained by one or more of the following: 1) the till has discontinuities that allow water to flow through it; 2) the pits are relatively deep, thereby considerably reducing the thickness of the till underlying the pits; 3) an old stream channel runs up through the pit area and may provide a pathway for pit leakage to pass through the till; and 4) water can eventually penetrate a till layer if sufficient time elapses.

Q. How do we know that contaminated particles present in the Great Miami River are not being settled out at a particular location such as where the river enters the Ohio River?

A. Water samples have been analyzed both with and without filtration. The levels of uranium in the two sets of samples are about the same. This indicates that almost all the uranium

SURFACE WATER ISSUES (continued)

in the river is in a dissolved state and will not settle out. The sediments in the Great Miami River continue to be sampled and only very low levels of uranium have been detected.

Q. Have any wells been tested in Ross?

A. The RI/FS ground water monitoring network includes about 70 off-site wells, including several in Ross. The Ohio Department of Health study also tested numerous wells throughout this area. No contamination has been found in wells in Ross.

Q. What are uranium levels in fish in the Great Miami River and Paddy's Run?

A. No levels of concern have been observed. [Participants were encouraged to review the Environmental Monitoring Reports and attend the Soils Session for actual data. Mention was also made of the acute and chronic testing and the macro-invertebrate study being conducted as part of the RI/FS].

Q. Why is the DOE continuing multi-million dollar construction projects at the FMPC if the plant is to shut down?

A. Response by J. Reafsnyder: DOE studies recommend shut-down of the FMPC, but there is no action toward that yet. Processing and production areas will likely operate for a number of years. Many of the projects are targeted toward environmental and safety improvements, reductions in air emissions, and storage warehouses for the drums and other waste containers that will remain at the site for some time. Considerable expenditures are also supporting and will continue to support clean-up activities.

Q. Are the old wet pits leaking into the aquifer?

A. Pits 5 and 6 are the only pits with water currently in them. These pits are no longer used as settling basins--the only water that enters them is storm water. Each of these pits is lined with a rubber membrane liner. Pits 3 and 4 were previously wet pits. These have been out of service and each has been covered.

Q. Have you tested the soil near the pits?

A. The soil covering the pits is clean fill material and not waste material. The waste materials underlying the soil cover were sampled during a previous investigation.

Q. Was the waste removed from the pits?

A. No, not yet--the cover material was placed over the waste materials. The evaluation of data in the RI/FS and the risk assessment will determine if the material will have to be removed.

Q. What is the depth of the pits?

A. The maximum depth is about 30 feet.

SURFACE WATER ISSUES (continued)

Q. Which pit has the fish in it?

A. This must be a reference to the lime sludge ponds, which are not waste pits. The lime sludge ponds contain boiler blowdown and sludge from the FMPC's water softening process.

Q. We use a pond as our drinking water source--have you tested water in ponds and lakes in the area?

A. We do not routinely test ponds and lakes, and we are not sure if the Ohio Department of Health tested any during its sampling program. If you want your pond or lake tested, please notify WMCO or the Ohio Department of Health.

Q. How are the storm water retention basins operated?

A. Storm water is routed into one of the two basins and retained for 24 hours to allow for settling. The water is then pumped to the river. As one basin is being pumped, any water entering the system is diverted to the second basin.

Q. How long have the basins been in operation?

A. The first basin has been in operation for about two years. The second basin just went on line last month [December 1988].

Q. Are the basins used to control non-radioactive contamination? Have there been any overflows from the basins?

A. The basins serve to remove suspended solids from the water, regardless of whether radioactive or non-radioactive contamination is associated with the solids removed. The first basin overflowed on four occasions in a two-year period. Its capacity was 6.5 million gallons. The construction of the second basin has expanded the total capacity to 10.2 million gallons.

Q. What is the area collected by the storm water retention basins? Were there any basins prior to 1986?

A. The basins collect storm water runoff from approximately 165 acres, including the Production Area (with reference to map showing area collected). No basins existed prior to 1986.

Q. Is sediment build-up expected?

A. Yes. We are required to clean out the accumulated sediment every two years to maintain sufficient capacity for proper settling.

Q. What was the basis of consent for the basins?

A. It was recognized that storm water runoff was the likely source of ground water contamination to the south of the FMPC. Therefore, a decision was made to collect this

SURFACE WATER ISSUES (concluded)

runoff and divert it to the Great Miami River after suspended solids were removed. This was the reason for the first basin. The second basin was required to satisfy the regulatory requirement that the basins have sufficient capacity to store the runoff from a 10-year storm (i.e., a storm that would be expected to occur once in 10 years, or to have a 10 percent probability of occurrence in a given year).

Q. How does ALARA come into play?

A. ALARA stands for "as low as reasonably achievable" and refers to the DOE policy that all work be controlled such that emissions and exposure are kept at levels as low as are reasonably achievable to protect workers and the public. This concept would be used more in deciding how a remedial action should be completed rather than in deciding which action should be selected.

Q. Is the FMPC in compliance with its NPDES permit?

A. In most areas, yes; in some areas, no. [The panel provided examples by referring to the required reporting of compliance in the Environmental Monitoring Report.]

Q. Do current findings show previous contamination?

A. Surface water data do not contain a link back to previous contamination. The best indicators of previous contamination are the sediments and soils. Very little contamination of the sediments has been found. The same is true for soils with the exception of easily explained areas of elevated concentration.

Q. Are you saying the surface water does not have a contamination problem?

A. Data collected in the Great Miami River show a detectable increase in uranium levels near the effluent discharge from the FMPC. These levels go as high as 5 micrograms per liter, compared to a background level of about 1 microgram per liter. The concentration quickly decreases and is back to near background levels by the time it reaches the monitoring points near New Baltimore.

Q. Does the level of contamination increase when there is a drought?

A. The values just discussed represent samples taken this past summer during a drought, and thereby indicate that conditions do not significantly worsen under such conditions. Typically, the levels of uranium in the river would be about 3 micrograms per liter near the effluent discharge.

GROUND WATER ISSUES

Bob Galbraith, RI/FS on-site technical coordinator, gave a short introduction about groundwater study procedures and findings thus far. The main points were:

GROUND WATER ISSUES (continued)

- The present investigation builds on previous work performed at the site and in the general area.
- Uranium is the key indicator for contamination associated with the FMPC.
- The areas where contamination has been found in groundwater are beneath the waste storage area and south of the FMPC, along Paddy's Run.
- No wells currently used for drinking water have been found with contamination during this phase of the investigation.

Other panelists were Gary Gaillot, RI/FS task leader, and Dennis Carr, engineer. The presentation was followed by questions and answers, which are identified below.

Q. Do the references to uranium mean enriched uranium?
A. All types of uranium are being investigated.

Q. Are you drilling wells to the south of the plant to look for uranium?
A. Yes.

Q. Does uranium vary from one area to another?

A. Yes. The maps show the difference in concentration for different areas.

Q. Does the size of the aquifer affect the values of uranium detected?

A. No. The size of the aquifer affects the distance of travel of the uranium and allows for more mixing and dilution.

Q. What is highest level of uranium found and at what depth?

A. The highest concentrations detected thus far are about 15,000 micrograms per liter. These are occurring approximately 20 feet below the ground surface under the Waste Storage Area.

Q. What was reason for testing only for uranium?

A. We are looking for numerous substances, but where we are finding any contaminants, uranium is always found; thus we are presenting the uranium to show the greatest extent of contamination.

Q. Will DOE analyze private wells for uranium, or do residents have to pay for it themselves?

A. Westinghouse [WMCO] will analyze private well water upon request for free. Westinghouse [WMCO] encourages residents to contact its FMPC office.

GROUNDWATER ISSUES (continued)

Q. Are you finding uranium to the east of the plant boundaries?

A. No, uranium has not been found above natural background levels east of plant boundaries.

Q. How far south have you drilled wells and have you found any uranium?

A. The southern most wells lie north-northwest of Rumpke Softball Park. No uranium above natural background has been found.

Q. What is the best way to remove uranium from my own well water?

A. EPA has removal guidance documents available. Contact EPA and they can provide you with information concerning the booklet.

Q. What is the time table for completion of the Feasibility Study?

A. We are looking at early 1990 for the south plume and 1992 for the complete site study.

Q. Will other reports be available sooner?
A. There will be earlier preliminary reports. [No report titles were recorded.]

Q. How much water does the FMPC pump out of the ground? Do you have your own cone of depression occurring in the water table?

A. FMPC presently has one well that pumps 500 gallons per minute. This is a very deep well and we do not know exactly how large an area is influenced.

Q. Define "normal" background [levels] for uranium.

A. We usually think in terms of one microgram per liter, or one part per billion.

Q. You spoke of water under Plant 6. What kind of hole can collect 25,000 gallons in it?

A. There are thin aquifers within the clay till around Plant 6 that contain water.

Q. Are EPA cluster wells being monitored? Can residents get information on them?

A. All the wells drilled for the RI/FS are installed under EPA-approved procedures. They are being sampled and results are available through the U.S. EPA.

Q. When will results of well testing be public?

A. Preliminary results are available now, as shown by the patterns on the maps; final results will be available in late 1989 or early 1990.

Q. What is the normal background level of uranium in Ohio?

A. The Ohio EPA took samples around the entire state and found normal uranium concentrations to be between 1 and 3 micrograms per liter.

GROUNDWATER ISSUES (Concluded)

Q. Are water levels low in the aquifers in this area?

A. Water levels are approaching normal levels as a result of rains in November and December near the Fernald plant. Water levels were two feet above November levels as of early January 1989.

The session concluded with residents moving around the room to look at the numerous maps that had been brought in, and talking individually with the technical panelists.

SOIL ISSUES

The Soil Issues session was staffed by Dr. John Frazier, the RI/FS health physicist; Rich Clark, responsible for biological sampling on the RI/FS; and Bob Conner, project manager. Dr. Frazier made a brief presentation which described the purpose of the session, the purpose of the soil sampling task, the methods and procedures for sample collection and analysis, and the results of the sampling program to date.

The purpose of the session was to describe the surface soil characterization task of the Remedial Investigation and Feasibility Study. This includes:

- Where to sample?
- How to sample?
- What to analyze for?

The purpose of the task is to determine whether there are above-background concentrations of radioactive materials in surface soil on the FMPC property and in the surrounding area. If above-background concentrations are found, determine the extent of the concentrations.

A three-part sampling and measurement program was developed to characterize the soil for radioactive materials. These are:

- Systematic surface soil sampling at uniform spacing throughout the property. This includes previous sampling out to five miles from the center of the site.

- Radiation measurements with portable survey instruments over more than 300 acres suspected of having elevated concentrations of uranium, by walking over every foot of these areas. Results of radiation measurements are used to identify any areas having radiation levels above background.

- Soil sampling at locations having the highest radiation levels above background (biased sampling).

SOIL ISSUES (continued)

The surface soil sampling tasks are complete and laboratory analyses of samples are nearly complete.

- There were 321 sample locations during the RI/FS with a total of 959 samples collected. Twenty-five of the locations were located off the site; three samples were taken at each location at three different depths, 0-2 inches, 2-4 inches, and 4-6 inches; or 0-6 inches, 6-12 inches, and 12-18 inches.

- During the spring of 1986, there were 311 sample locations (most locations were off the site) with a total of 939 samples collected at three depth increments, 0-2", 2-4", and 4-6".

- The Ohio Department of Health has collected and analyzed soil samples from 34 off-site locations.

The following results were presented:

1. Soil sampling results for 1986 sampling out to five miles from the center of the FMPC were presented and discussed. Soil sampling and radiation measurements performed as part of the Remedial Investigation were also presented and discussed. Of the approximately 939 samples collected in 1986, there was no indication of above-background concentration of uranium in soil beyond approximately 1-1/2 miles form the center of the FMPC.

   All off-site concentrations were only slightly above normal background concentrations except for very small areas adjacent to the FMPC property to the east. No radionuclides other than uranium isotopes were found above natural background concentrations in all off-site samples.

2. RI/FS soil sample results to date indicate only uranium isotopes are above-background in any off-site areas. Only very localized areas adjacent to the FMPC property to the east have above background concentrations of uranium.

3. The Ohio Department of Health analyses of soil samples in the vicinity of the FMPC indicate total uranium concentrations of from 0.5 picocuries per gram to 6.9 picocuries per gram.

Dr. Frazier presented the following interpretation:

1. Uranium is a naturally occurring element in the environment. Concentrations of uranium in surface soil vary greatly throughout the United States. Uranium concentrations in soil depend on the geological history of the area, the use of the soil, and a number of other factors.

SOIL ISSUES (continued)

At the FMPC, uranium concentrations have been measured in soil samples at on-site locations and for many locations out to approximately five miles from the FMPC. Plots were presented that showed the measured uranium concentrations in soil for each quadrant -- northeast, southeast, southwest, and northwest -- surrounding the FMPC. The decrease in concentration with increasing distance from the FMPC was noted. Measured concentrations were compared with natural background concentrations and with concentrations of concern.

2. Natural background concentrations of uranium in soil were discussed.

   - The National Council on Radiation Protection and Measurements (NCRP) has reported that the average concentration of uranium in soil in the United States is 1.2 picocuries per gram.

   - A 1981 published report of measured uranium concentrations in the United States listed the range of natural background concentrations in soil in Ohio to be from 1.5 picocuries per gram to 4.4 picocuries per gram.

   - Soil is principally composed of degraded rock, which can have uranium concentrations from 0.3 picocuries per gram to more than 50 picocuries per gram.

   - Fertilizer can have very high concentrations of uranium (100 picocuries per gram or more) and increases the concentration of uranium in soil when added to the soil.

3. What are concentrations of concern for public health?

   - NCRP recommends not growing crops that take up uranium if there are 2,000 or more picocuries per gram of uranium.

   - Calculation of radiation doses from all pathways for individuals living on soil containing uranium gives 100 picocuries per gram to 200 picocuries per gram as the concentration of uranium in soil, which does not give a radiation dose greater than the total natural background dose.

   - DOE, the Nuclear Regulatory Commission (NRC), and the U.S. EPA have used 35 picocuries per gram as a cleanup level for uranium in soil, using very conservative protection factors.

The presentation was followed by questions and answers, which are identified below.

Q. Does rain water wash away uranium that is present in soil?

A. Typically not. Uranium is dense and is readily incorporated into the soil; it is not washed around in the soil. Only in cases where erosion is evident would uranium be washed away.

SOIL ISSUES (continued)

Q. What is the background concentration for uranium in picocuries per gram for this area's soil?

A. Background concentrations of uranium vary across the country depending on the type of rock present. Certain sands contain approximately 0.3 picocuries per gram. Other types of soils can contain as high as 50 to 60 picocuries per gram of uranium. Across Ohio, the average is 1.5 to 4.4 picocuries per gram. For the area around Fernald, soil concentrations of uranium range from 0.5 to 5.0 picocuries per gram.

Q. Do the top two inches of soil have higher levels of activity compared to the six-inch samples?

A. The activity is expected to decrease with depth; however, in most cases, the activity has remained the same. The technical team said that they had expected to find higher levels of uranium in the upper two inches of soil, and this is what was found on FMPC property and on small off-site areas adjacent to the FMPC.

Q. How heavy is uranium? Does it blow from the soil's surface?

A. Uranium is approximately one and a half times as dense as lead. It is typically deposited near the release point, that is, in the FMPC process area.

Q. Were elevated readings of soil activity found at the Elda School?

A. The 1986 sampling and the RI/FS sampling did not show elevated concentrations of radionuclides in the soil at the Elda School. It is possible for some deposition to occur by being carried by the wind. [This topic is discussed in the Air Isues session.] However, the data suggest that uranium deposition has decreased with distance from the site. Background levels are found 1 to 1-1/2 miles and beyond from the center of the process area.

Q. Do plants and grasses take up uranium from the soil?

A. In areas where elevated levels of uranium are present in the soil, roots of plants typically contain elevated levels of uranium. Upper parts of the plants typically contain much less activity. It should be pointed out that it is difficult to remove dirt from the root systems of plants, making it difficult to get an accurate reading of uranium that the plant has actually taken up. A few vegetation samples have been found on the plant site with above-background concentrations of uranium. It is important to realize fertilizers contain elevated levels of uranium. Extensive sampling of produce in the area shows no elevated levels of uranium when compared to produce sampled in Indiana. Produce samples collected off the FMPC site showed levels of radionuclides that are not above background levels when compared with a control area in Brookville, Indiana. An environmental monitoring record that updates this information is published by WMCO each April. The report contains results of soil and produce sampling. The report is available in the reading rooms.

Q. What are the results of animal studies?

SOIL ISSUES (continued)

A. A cow from Knollman's farm was taken and the meat and liver were analyzed. Results showed no elevated levels. Milk samples have been collected for many years and have never shown detectable levels of uranium. [Problems discovered during data validation exclude this data from the RI/FS database.]

Q. Is one animal sample statistically significant?

A. No; however, milk is regularly sampled. A deer sample was also procured and analyzed, as well as numerous small animals such as shrews and opossums. Suggestion by a group member: More large animals should be sampled, in particular, Knollman's cows. Dr. Frazier noted that uranium is not concentrated or significantly retained in the edible portions (meat) of animals.

Q. How can we trust your data and statements?

A. Stringent procedures are followed, samplers were used only once and then thoroughly cleaned, detailed records were kept, and chain of custody and sign-offs for sample handling were in place. The lab regularly compares its methods and results with other labs, and lab checks are made against known quantities to be sure of accuracy. Lab results are checked by hand and rechecked. Dr. Frazier noted that he has personally reviewed all aspects of the operation and has found no reason to disagree with the presented results.

Q. What are the results of analysis of body parts of Fernald workers that have been conducted?

A. We are not aware of this happening. Bob Conner will follow up. [The individual was encouraged to fill out a comment card for DOE's response.]

Q. The paper and TV are reassuring about the environment around the plant, but Representative Luken is of the opposite opinion. Who do we believe?

A. The technical panel reiterated the "controlled process" that the RI/FS follows [and the analytical results being obtained, then left the answer up to the audience.]

Q. Some participants noted they have heard stories about two children, one with a leg amputated and the other sick. What are the details?

A. The technical people are familiar with the garden location where one child reportedly worked with his father. No high results have been found in produce from that site. We understand the family lives approximately 10 miles from the site, the garden spot being somewhat closer than 10 miles from the FMPC. We cannot comment on the laboratory results. We have requested copies of the sample analysis reports and human assessments but have not received them.

SOIL ISSUES (continued)

Q. One participant noted she has been located near the FMPC since 1968. What testing is available to identify uranium in residents' bodies? In 1968 there was a lot of dust in the air.

A. A whole body counter has been available to anyone requesting a uranium count at the FMPC. Air data are available in monitoring reports.

Q. Why were pine trees planted near Route 126? Were they hiding anything?

A. Trees were planted for beautification of the site at several times, including during the Johnson presidential era.

Q. Dr. Gilbert of Ohio State University questioned why is soil just not brushed off for sampling?

A. The technique was used at a DOE facility in the western United States where there was not much vegetation cover. That technique was not considered appropriate for the FMPC area. The technique for soil sampling here and at the FMPC was developed by the American Society for Testing and Materials and their procedure was considered appropriate for the FMPC area.

Q. How much contamination is found three to five miles off site?

A. There is a decrease in uranium in picocuries per gram with distance from the plant. Background levels are reached at 1 to 1-1/2 miles from the center of the process area.

Q. Are pit studies available? A study was conducted by the University of Cincinnati.

A. We are not aware of this study. Roy F. Weston sampled and analyzed the pits. Pit 4 is now capped.

Q. The studies were conducted by Dr. Silberstein for asbestos.

A. Bob Conner of WMCO will follow up.

Q. Is a gridwork available for the sampling? Are higher readings found on hilltops, hillsides, and valleys? How do they compare?

A. Grids are set 2,000 to 2,400 feet apart for the litigation study. The RI/FS uses 1,000-foot intervals for much of the site. The U.S. EPA samples taken on the north and east boundaries were at 250-foot intervals. The production area was sampled at 250-foot intervals, as well.

Q. Did you test soils for other compounds?

SOIL ISSUES (concluded)

A. Yes, we tested for any radionuclides of record on the site. Included were isotopic uranium, isotopic thorium, cesium-137, ruthenium-106, strontium-90, technetium-99, neptunium-237, and isotopic plutonium.

Q. How many sites were sampled? Was only uranium sampled for in 1988?

A. There were 321 locations sampled during the RI/FS. Off-site sampling in 1986 looked for uranium in all samples, and for all radionuclides for several of the samples. Other radionuclides were found to be at natural background levels.

Q. Where are the other compounds reported?

A. Contact DOE. The results are defense exhibits in the class action suit.

Q. What about water contamination north of the site? It was probably tested by the EPA. The Water Users Association had to extend water lines to this area because the well water was said to be contaminated.

A. The well water may have been unacceptable for drinking water for a number of reasons not related to the FMPC site. See the ground water session for more information.

ATTACHMENT D

PUBLIC RESPONSE TO THE JANUARY 31, 1989 FMPC RI/FS COMMUNITY MEETING

ATTACHMENT D

PUBLIC RESPONSE TO THE JANUARY 31, 1989 FMPC RI/FS COMMUNITY MEETING

INTRODUCTION

Along with communicating verbally with the technical specialists on hand during the individual working sessions, community members attending the January 31 Community Meeting asked questions and provided feedback about the meeting in several ways. They completed comment cards, added their names to the RI/FS mailing list, and provided written evaluations of the meeting, using simple forms provided. This feedback provides useful information about the community's information needs, their concerns, and their perceptions about the RI/FS process, including public meetings. This information can, in turn, be used as a valuable planning tool to identify topics for future meetings or written materials, such as fact sheets.

COMMENT CARDS

A total of 21 comment cards were completed and returned by local residents attending the meeting. This represents about nine percent of meeting participants. In addition, one resident followed up the meeting with a six-page letter of comment.

The cards were distributed on tables in high-traffic areas before, during, and after the meeting. Facilitators in each session also encouraged participants to use the cards to request supplemental written information, often based on verbal questions posed during the meeting. A copy of the two-sided comment card, which bears DOE's address, is included in this attachment. The cards may be used as a mechanism for feedback during future public events.

The residents used the comment cards to ask questions about the following topics:

- Health studies at the FMPC
- Inaudible emergency siren
- The number of Environmental Impact Statements prepared for the FMPC
- Current use of anhydrous ammonia at the plant
- Air contamination
- Availability of the DOE 2010 Report
- Health risks to children who attend Crosby School and who live along Dick Road
- Asbestos study results for Pit 4
- Maps of ground water in the Fernald vicinity
- Testing of individual wells, on request

The following reports were requested:

- The RI/FS Work Plan.
- FMPC Environmental Monitoring Annual Report for 1987 and 1988.
- EPA study of residential water treatment systems relating to the most effective way to remove uranium from water.
- Ohio Department of Health Study of Radioactivity in Drinking Water and Other Environmental Media in the Vicinity of the U.S. Department of Energy's Feed Material Production Center and the Portsmouth Gaseous Diffusion Plant.

In addition to these questions and requests, residents offered the following written suggestions:

- Enlist the support of local officials and medical professionals to "tell the Fernald story".
- Use identifying badges for DOE and contractor staff at future public meetings.
- Ensure that the public address system used at future meetings works properly.
- Tell the public "the complete truth".
- Give simple explanations.

The procedure for responding to residents' questions, comments, and requests draws on the strengths of the technical experts who shared information at the meeting. Each question is routed to the lead technical panelist of the session that best relates to the question/comment at hand. The respondent is instructed to answer each question adequately in an effort to be responsive to this member of the public. Sensitive issues will not be skirted. All response letters will be reviewed, then approved and signed by the DOE Site Manager.

NAMES ADDED TO THE RI/FS MAILING LIST

A total of 41 persons asked that their names be added to the RI/FS Mailing List. In addition, the 21 persons who submitted comment cards will be added to the list. These residents live in the communities of Hamilton, Harrison, Okeana, Englewood, Forest Park, and Ross, Ohio, as well as Cincinnati and Columbus, Ohio.
The mailing list forms the basis for distribution of future meeting notices, fact sheets, and other related events and materials.

EVALUATION FORMS

A summary of the public response to the meeting, based on evaluation forms returned during the meeting, is provided here. Overall, respondents found the sessions useful. Respondents were relatively neutral about the usefulness of the introductory session and individual working

sessions. The small group sessions, in general, were found to provide the most useful information. The Ground Water Issues session received the most positive response. A breakdown of the audience assessment is noted on the summary evaluation form provided at the end of this attachment.

Some residents added comments, posed questions, and suggested topics they would like to see covered in future meetings. These comments included:

- Hold future meetings in one room.
- Homeowners need information on ways to clean or improve the quality of their soil and water.
- Where will future funding for FMPC cleanup activities come from?
- Sessions are needed for specific public groups, such as those who live in Okeana, Ross, and on Oxford/Dick Road, or for plant employees.
- Focus future presentations on human health issues.
- When does cleanup begin?
- Impolite, inappropriate comments made by plant employees (as members of the audience) during the Air Issues Session antagonized other members of the audience.

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COMMENT CARD

If you would like further information or if you have a comment, please complete and return this card. Please print.

NAME: TELEPHONE NO.:

ORGANIZATION (If Applicable):

ADDRESS:

COMMENTS AND QUESTIONS:

I would like to be added to the RI/FS Fact Sheet mailing list. ☐ Yes ☐ No

U.S. DEPARTMENT OF ENERGY
P.O. BOX 398705
CINCINNATI, OHIO 45239

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SUMMARY EVALUATION FORM

January 31, 1989

Dear Neighbors,

This meeting is a little different from earlier meetings. We divided in into small group work sessions to allow you to meet people who are actually doing studies at the Feed Materials Production Center, and to let you ask them about the studies. The goal was information exchange. Please take a few minutes to let us know whether and how well we met the goal and how we can improve on the information exchange process. Thank you.

Ratings: 1 = very useful; 2 = useful; 3 = not useful

1. How useful were the sessions you attended? Did they increase your understanding of the Remedial Investigation and Feasibility Study process and other environmental issues at the Feed Materials Production Center?

Session	1	2	3
DOE Background		3	3
US EPA Role	1	3	1
Ohio EPA Role	1	3	1
RI/FS Process, Results, Overview	4	1	2

2. Please rate the information you gained during the these sessions:

Session	1	2	3
Ground Water Issues	4	2	1
Surface Water Issues	1	1	2
Soil Issues		3	1
Air Issues		2	1
FMPC Environmental Improvements	1		2

3. Please rate the method of presentation of each of the following:

	1	2	3
Large group introductory session	2	3	1
Small group sessions	4	1	1
RI/FS videotape		1	1
RI/FS exhibit			2
Fact Sheets and printed materials	2	1	1

4. What topics would you like to see covered in future meetings?

_____

_____

THANK YOU FOR YOUR COMMENTS.

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